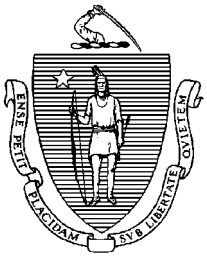
Environmental Performance Partnership Agreement: 2002-2003

May 2002

Massachusetts Department of Environmental Protection

U.S. Environmental Protection Agency
New England



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XII. Achieve Clean Water and Protect Aquatic Ecosystems

Clean Water Goal #1: Ensure that every public water supply consistently provides water that is safe to drink.

Achieve Clean Water and Protect Aquatic Ecosystems

Clean Water Goal #1: Ensure that every public water supply consistently provides water that is safe to drink

A. Self Assessment

1. Status of Drinking Water Supplies

Why is water supply protection important?	Massachusetts is a densely populated and heavily industrialized state that draws a significant portion of its water supply from vulnerable aquifers. Because our state's continued quality of life and economic competitiveness both depend on safe and abundant water, ensuring the purity of our public drinking water supplies is of paramount importance.
Where does drinking water come from?	About 95% of Massachusetts citizens get their drinking water from public water supplies. Many of the largest population centers in Massachusetts draw their drinking water from surface sources, while rural areas tend to be served by wells. About 61% of all Massachusetts residents on public supplies drink water taken from 189 reservoirs and other surface water sources. These systems tend to be municipally owned and operated. By comparison, many more public supply sources (2,683) draw from groundwater sources, but they serve only 23% of the state's population. The remaining population on public supplies (16%) is served by systems using a mix of surface and groundwater sources. About 5% of Massachusetts citizens obtain their drinking water from private wells, which are not regulated by DEP, but rather, cities and towns.
What can pollute drinking water?	Most public supply wells in Massachusetts draw from shallow sand and gravel aquifers, which are highly vulnerable to contamination. Contaminants may move with water overland or through soil to contaminate surface or ground water supplies, and may come from a variety of sources including landfills, industrial processes, septic systems, pesticide application and naturally occurring features.
How safe is our drinking water?	Public drinking water in Massachusetts is very safe. DEP has very stringent standards that ensure public drinking water is safe. Local public water suppliers are required to perform ongoing tests for the presence of bacteria, lead and other heavy metals, herbicides and pesticides, and industrial solvents. If contaminants exceed the Maximum Contaminant Level (MCL)[2] standards, the water supplier is required to notify consumers through local newspapers or radio stations. If bacteria or chemicals pose a threat to public health, the water supply is treated to remove the contaminants or taken out of service until a solution is found.

[2] Maximum Contaminant Levels are the maximum permissible level of a contaminant in water delivered to any user of a public water system.

2. Program

What are DEP's strategies to protect water supplies?

Strategies to ensure that every public water supplier consistently provides water that is safe to drink include the protection of water supply sources, any necessary treatment prior to distribution, protection and maintenance of distribution systems, monitoring of public water supply systems to ensure provision of safe drinking water, and assurance that all systems have sufficient technical, managerial and financial capacity.

Specifically, DEP has adopted the following as part of the above strategies:

- Implementation of the Watershed Approach, including reorganization of staff around watersheds
- Enhanced compliance and enforcement
- The Comprehensive Source Water Protection Plan
- Implementation of an active public awareness and participation process
- Revision of the certified operator requirements
- Implementation of the Capacity Assessment and Assurance Program to ensure that all systems have the financial technical and management capability to fully comply with all drinking water requirements
- Provision of financial incentives through reduced monitoring cost for systems with good water quality and source protection programs
- Strengthened watershed protection regulations for Class A reservoirs
- Strengthening of Title 5, and
- Implementation of new federal primacy requirements.

What are the requirements of the federal Safe Drinking Water Act (SDWA) and the Massachusetts Drinking Water Program?

Among other things, the SDWA requires that water suppliers collect periodic samples from each active source, analyze these samples in a certified laboratory for contaminants and report their findings to environmental regulators. If an MCL, Action Level or treatment technique is violated the public water system is required to take all necessary actions to eliminate the violation, including temporary shutdown of affected sources, public notification, follow-up sampling, and corrective measures.

The SDWA also requires all public water systems to be operated under the supervision of a certified operator. In addition, systems must provide annual Consumer Confidence Reports to each bill-paying customer. Public water systems are also required to have sufficient technical, managerial and financial capacity to comply with the SDWA and state drinking water standards.

What is DEP's role in carrying out these strategies?

DEP, through its Drinking Water Program, administers and enforces the requirements of the SDWA in Massachusetts. From its headquarters in Boston and regional offices in Lakeville, Springfield, Wilmington, and Worcester, and laboratory in Lawrence, DEP is involved in every facet of delivering safe, clean drinking water to everyone that lives, works, and visits our state.

DEP provides grassroots assistance to citizen groups, municipalities, regional planning agencies, and water suppliers as they implement the drinking water requirements including surface and groundwater protection programs.

What is DEP's role in carrying out these strategies? (continued)

In addition to providing individual technical assistance, conducting outreach and training for local officials, and providing guidance documents, DEP initiated several new programs from 1999-2001 to assist communities in protecting their public water sources and the long term quality of their drinking water system, as follows:

- The Source Water Assessment Program (SWAP) is a federal program. This program requires DEP to provide the public with information about the potential threats within their public water supply protection areas by May 2003. Local communities will be able to use the SWAP assessment information to make protection improvements and establish inspection and management priorities. DEP also initiated a $1.4 million effort to delineate Zone IIs (hydrogeologically determined well recharge areas) for almost 200 public supply wells. These delineations will assist communities in targeting their efforts to protect water supplies.
- The Wellhead Protection and Source Water Protection Technical Assistance/Land Management Grant programs will provide up to $710,000 to communities for protection projects.
- The Capacity Assessment and Assurance Program evaluates and assists each system to maintain sufficient technical, managerial and financial resources to stay in compliance with the SDWA requirements.
- The Consumer Confidence Reporting Program, which will require all public water systems to inform their customers annually about their supply, particularly its quality.
- The pre-implementation of compliance monitoring programs for the disinfection by-product and interim enhanced surface water treatment rules will assist systems in treating contamination effectively and will enhance the compliance and protection of drinking water systems. Pre-implementation tasks include profiling and disinfection benchmarking, training and technical assistance.

Who is responsible for delivering safe and clean water?

DEP views itself as but one member of an expansive team responsible for delivering safe, clean water to the people of Massachusetts. The state's public water suppliers have remained active members of this team by taking advantage of technical assistance and training opportunities, collecting data, watching trends, and participating in DEP rulemaking. Working in cooperation with public water suppliers for more than 25 years, DEP will continue to promote:

- Implementation of comprehensive surface and groundwater protection programs for the state's public water supplies
- Professional certification and training for drinking water operators so they are better equipped to guide their systems toward SDWA compliance
- A statewide compliance and technical assistance program to help public water suppliers meet SDWA requirements
- Targeted sampling and testing of drinking water sources for bacteria and many organic chemicals, including pesticides
- Regulatory flexibility to maximize drinking water protection while minimizing costs to water suppliers and their ratepayers
- Emergence and use of new, efficient, and low-cost technologies to help water suppliers achieve compliance with more stringent standards, and to help analytical laboratories accurately detect contaminant concentrations at lower levels
- Initiation of early contamination detection, cross connection control, public education, and other programs aimed at maintaining the quality of drinking water from the source to the tap
- Expanded use of computer and information technology in all facets of the drinking water program, including source water mapping, data management, and communications with water suppliers, and
- Better consumer awareness about the need for safe, clean drinking water and the programs being implemented at the local, state, and federal levels to ensure that today's abundant supplies are conserved and protected for the future.

How are Massachusetts water suppliers doing?

Massachusetts public water suppliers generally have an excellent compliance track record. In 2000, the most recent year for which complete data is available, 94% reported no MCL violations. Out of a total of 175 systems with access to surface water sources and required to meet SWTR treatment technique requirements, 99.4% were in compliance (97% in full compliance and 3% continuing to work under approved compliance agreements consistent with legal requirements under the Safe Drinking Water Act). Massachusetts' overall excellent compliance record is due to the continuous hard work of the 1,643 water systems in the Commonwealth. Through their implementation of source protection programs that include routine inspections and consumer education components, local water systems are better able to protect their sources of water. At the end of 2000, 608 water systems had water supply protection controls in place with 5.6 million people drinking water from a source with some measure of source protection. Public water suppliers in the Commonwealth are also in the forefront in seeking out new and innovative, cost effective treatment technologies to improve the level of water treatment. Our public water suppliers have significantly improved their monitoring and reporting compliance rate despite the increased monitoring and reporting requirements. In 2000, 81% met all monitoring and reporting requirements. Massachusetts public water suppliers are attending training in record numbers and are planning ahead to ensure the ability of their systems to comply with all drinking water requirements.

3. Challenges for 2002-2003

Why must DEP continue its drinking water protection efforts?

Massachusetts is recognized by national associations and other states as a leader and innovator in safeguarding its water supplies. As it stands on the threshold of a new century, DEP must be poised to respond creatively and effectively to the many water supply challenges remaining to be met. New housing starts and industrial expansion are once again on the increase, placing additional demands on our drinking water reserves. It will be all that much more important, then, that DEP and public water suppliers not only maintain, but expand, an effective drinking water program and aggressive source water protection initiatives in the years to come.

What is DEP's approach toward achieving compliance?

DEP continues moving toward more holistic regulation, viewing all regulated facilities and their collective impacts on whole watershed ecosystems at once. The agency will need to explore additional ways in which it can minimize burdens on water suppliers and costs to consumers while maximizing the environmental and public health yields of its programs.

Even as it begins moving away from the traditional command and control approach, however, DEP will need to step up its efforts to identify and bring into SDWA compliance the many public water suppliers who until now have operated without government oversight. And for all public water suppliers, but particularly for those whose customer bases are small or transient, DEP must strive to expand its education, outreach, and technical assistance programs.

Equally important, DEP must continue to keep the consumers of Massachusetts' water informed about, and involved in, ongoing efforts to ensure that drinking water remains clean, safe, and plentiful for future generations. DEP will coordinate all of its informational and outreach programs, like the Consumer Confidence Reporting, to keep citizens informed and involved. New technologies for interacting with and training both water suppliers and consumers will be employed. This will include better utilization of web pages, telecommunications information broadcast functions and distance learning.

DEP is also strongly committed to the identification and development of innovative, effective and low-cost technologies for the treatment of drinking water. In the coming years, water systems will need these types of technologies to comply with all of the new requirements.

Central to any effective strategy to address remaining environmental challenges is the existence of a strong and coherent compliance and enforcement strategy. DEP's safe drinking water compliance and enforcement strategy has two components: geographic and programmatic.

- Geographically, the Watershed Approach is the overarching means of identifying and taking action on the most serious violations affecting the most critical resource areas.
- Each program unit in the Bureau of Resource Protection has identified types of activities that should be targeted for compliance and enforcement focus.

B. Baseline Conditions

Number and Population

Baseline environmental conditions regarding public water supplies at the start of the 2002 Performance Partnership Agreement period included:

- Total number of Public Water Supplies

Community Systems *	= 513, population served =	6,044,269
Non-Transient Non-Community Systems	= 227, population served =	67,075
Transient Non-Community Systems	= 903, population served =	161,395
Total	1,643 population served =	6,272,739**

*Community systems serve year-round residents; Non-Transient Non-Community systems serve the same people approximately four or more hours per day, four or more days per week, more than six months or 180 days per year (e.g. schools or workplaces); Transient Non-Community systems serve different people at least 60 days of the year (e.g. restaurants, public buildings or campgrounds).

**Population served represents maximum annual (or winter) population.

Meeting Standards

- In 2000, 6 sources of water were removed from service due to contamination; Over a period extending more than 25 years, fifty-one communities in Massachusetts have removed at least one well from use because of contamination; Major culprits have included accidental spills, chemical-manufacturing wastes, clandestine dumping, failing septic systems, landfill leachate, leaking underground storage tanks and wintertime salting of roads
- No reported waterborne disease outbreaks related to *Cryptosporidium, Giardia, enteric virus, or bacteria* occurred in 2000
- 94% of public water systems meet federal and state Maximum Contaminant Levels (MCLs)
- 81% of the public water systems are in compliance with monitoring and reporting requirements of the Safe Drinking Water Act (SDWA)
- 14 of 1,643 public water systems had boil orders in 2000 (and returned to compliance), and
- 1,605 of 1,643 public water supply systems meet the Lead Action Level in 2000; All systems that did not meet the action level are working under enforceable schedules towards resolution; In 2000, 5 cases of lead poisoned children living in homes with a high level of lead in their drinking water were referred to DEP by the Massachusetts Department of Public Health for investigation; All of these cases were investigated and resolved.

Treatment and Distribution

- 168 of the 175 systems (those using the 189 surface water sources and community wells directly fed by surface waters) have complied with the surface water treatment rule; The other 6 are operating under consent orders to filter their sources, upgrade their treatment facilities, find alternative sources or meet other specific criteria to avoid filtration, consistent with legal requirements under the Safe Drinking Water Act, and
- 91.7% (475 of 518) community public water systems have approved distribution protection plans (cross connection control).

Water Supply Protection

- 1,555 sources are protected by appropriate source protection activities reviewed by DEP, and
- 89% of the population drink water from community water systems with some measure of source protection reviewed by DEP.

Measures of source protection include -

Regulatory Measures: Protection measures a water system or municipality establishes to meet a DEP source protection regulation -

a. adoption of local protection controls that meet Wellhead Protection Regulations, 310 CMR 22.21, or Surface Water Regulations, 310 CMR 22.20, and
b. development of a Surface Water Protection Plan as required by 310 CMR 22.20.

Programmatic Measures: Protection measures a water system establishes to meet a DEP source protection program criteria -

a. development of a source protection plan for obtaining a waiver under the Monitoring Waiver Program, and
b. development of protection plans and projects funded by DEP Source Protection Grants; Protection projects funded by these grants must meet certain criteria and be approved by DEP.

Voluntary Measures: Protection measures a water system or municipality develops or implements voluntarily; such as local protection controls, protection plans, public education, fencing, etc.; voluntary measures do not necessarily meet DEP regulations or criteria for source protection, however such local efforts do provide some measure of protection to the source.

- 419 Zones IIs covering 927 wells have been approved
- 76 municipalities served by 426 sources now have local controls that meet state wellhead protection requirements, and
- 1,023 unauthorized injection wells have been eliminated to date.

B. Milestones

By the end of 2002

- All federal rules and regulations required to maintain primacy will be implemented, e.g. Interim Enhanced Surface Water Treatment rule, and Disinfection Byproducts rule, Public Notification
- All transient non-community systems will be operating under the new DEP self-survey program and 40% will have had at least one DEP sanitary survey audit
- 100% of all surface water systems with avoidance of filtration waivers will receive annual on-site sanitary surveys and all compliance issues discovered during the surveys will be follow-up on within 45 days
- 100% of all compliance related health issues discovered during a sanitary survey will result in immediate compliance follow-up and all other non-health related issues discovered during a sanitary survey will be followed-up within 45 days
- 40% of all community and non-transient non-community systems will have received capacity development evaluations to help them to achieve capacity development goals and maintain compliance with the SDWA.
- 99% of the registered pubic water systems population will be served by public water supplies managed by operators who meet state-approved certification and re-certification requirements
- DEP will have established “partnerships” with five environmental, trade, or public agencies to assist in drinking water awareness activities
- 100% of all illegal injections wells discovered within wellhead protection areas will be closed upon discovery
- 100% of wells pumping greater than 100,000 gallons per day will have approved Zone II delineations and wellhead protection measures in place, and
- 100% of all illegal injections wells discovered within wellhead protection areas will be closed upon discovery.

By the end of 2003

- All federal rules and regulations required to maintain primacy will be implemented, e.g. Radionuclides, Filter Backwash Rule
- All transient non-community systems will be operating under the new DEP self-survey program and 60% will have had at least one DEP sanitary survey audit
- 100% of all surface water systems with avoidance of filtration waivers or disinfection log credit will receive annual on-site sanitary surveys and all compliance issues discovered during the surveys will be follow-up on within 45 days
- 100% of all compliance related health issues discovered during a sanitary survey will result in immediate compliance follow-up and all other non-health related issues discovered during a sanitary survey will be followed-up within 45 days
- 60% of all community and non-transient non-community systems will have received capacity development evaluations to help them to achieve capacity development goals and maintain compliance with the SDWA
- 100% of the registered pubic water systems population will be served by public water supplies managed by operators who meet state-approved certification and re-certification requirements
- DEP will have established "partnerships" with ten environmental, trade, or public agencies to assist in drinking water awareness activities
- 100% of wells pumping greater than 100,000 gallons per day will have approved Zone II delineations and wellhead protection measures in place, and
- 100% of all illegal injections wells discovered within wellhead protection areas will be closed upon discovery.

By the end of 2005

- Source Water Assessment Program assessments will be completed for all public water supply systems
- Implement programs for Safe Drinking Water primacy requirement programs when required to do so by the SDWA, e.g. Radon, Ground Water Rule, Unregulated Contaminant Monitoring, Disinfection Byproducts Rule, Interim Enhanced Surface Water Treatment Rule, Public Notification, and Radionuclides
- 100% of the registered public water systems population will be served by public water supplies managed by operators who meet state-approved certification and re-certification requirements
- All public water supplies will have their own distribution protection programs to regularly survey and protect the quality of water in their distribution systems
- DEP will audit the distribution protection programs of 50% of all community public water suppliers
- Complete non-community Surface Water Treatment Rule/Ground Water Under the Influence (of surface water) evaluations
- All public water supplies will have had a sanitary survey comprehensive performance evaluation
- All community public water systems will be providing annual water quality Consumer Confidence Reports to their consumers
- All non-community public water systems will be provided with annual water quality Consumer Confidence water quality reports, and
- DEP will be providing annual reports to EPA on the state's compliance information.

By the end of 2005 (continued)

- All transient non-community systems will be operating under the new DEP self-survey program and will have had at least one DEP sanitary survey audit
- 100% of all surface water systems with avoidance of filtration waivers will receive annual on-site sanitary surveys and all compliance issues discovered during the surveys will be follow-up on within 45 days
- 100% of all compliance related health issues discovered during a sanitary survey will result in immediate compliance follow-up and all other non-health related issues discovered during a sanitary survey will be followed-up within 45 days
- 100% of all community and non-transient non-community systems will have received capacity development evaluations to help them to achieve capacity development goals and maintain compliance with the SDWA
- 100% of the registered pubic water systems population will be served by public water supplies managed by operators who meet state-approved certification and re-certification requirements
- DEP will have established "partnerships" with twenty environmental, trade, or public agencies to assist in drinking water awareness activities
- 50% of non-community systems will have approved wellhead protection measures in place
- 100% of all illegal injections wells discovered within wellhead protection areas will be closed upon discovery
- 1,225 unauthorized injection wells will be returned to compliance
- 100% of wells pumping greater than 100,000 gallons per day will have approved Zone II delineations, additionally, all required wellhead protection measures will be in place, and
- 100% of all illegal injections wells discovered within wellhead protection areas will be closed upon discovery.

Lab Inspection Milestones

In accordance with previously agreed upon Laboratory Inspection Strategy of June, 1998, DEP will take the following steps to inspect all in-state microbiological laboratories at least once every three years, as soon as possible:

- By April 1, 2002 commit MA State resources to obtain on-site inspections services for all in-state certified microbiology laboratories

- By December 31, 2002 perform on-site inspections of at least 26 microbiology laboratories, with priority given to those that have reported drinking water analyses data within the last 3 years

- By December 31, 2003 perform on-site inspections of at least 36 microbiology laboratories, with priority given to those that have reported drinking water analyses data within the last 3 years, and

- Between March 1, 2001 and March 1, 2004 complete an on-site inspection and make a certification determination on all in-state microbiology laboratories.

D. What needs to be done:

1. Protect water supply sources.

Management Strategies

This is how DEP will protect water supply sources:

- Promote wellhead and watershed protection plans, and implement comprehensive source water assessment and protection program, as well as the Drinking Water Program's comprehensive compliance and enforcement strategy
- Continue to:
  - ⇒ provide communities with funding for protection projects through the Wellhead Protection and Source Water Protection Technical Assistance/Land Management Grant programs
  - ⇒ review and appropriately approve Zone II delineations, source protection plans, and all other protection strategies, permits, and compliance activities
  - ⇒ improve groundwater discharge and Title 5 regulations from a usability perspective, continue to review such discharges and their proximity to water supplies, and continue implementation of the Underground Injection Control Program
  - ⇒ improve efforts and mechanisms to identify contamination sources
  - ⇒ coordinate and integrate source water protection across state programs
- Provide:
  - ⇒ technical assistance on meeting DEP wellhead protection requirements to all communities receiving Zone II delineations through the SRF Zone II project
  - ⇒ compliance assistance to public water suppliers, including training, grant funds, and implementation of capacity development regulations
  - ⇒ reimbursement to certified operators of small systems that receive training on source protection and other Drinking Water Assessment programs
- Link Underground Injection Control Inspections with five year cycle of the Watershed Approach and Source Water Assessment Plan
- Integrate drinking water supply activities into DEP-targeted basins
- Coordinate Source Water Assessment Program with Geographic Information System, other program databases, sanitary surveys, Site Discovery and other programs, and
- Utilize the public awareness opportunities afforded by the Consumer Confidence Reporting, public notification program and other outreach programs to educate consumers on source protection requirements.

P-A-C-E-R Activities

We will carry out our management strategies through these activities.

Permitting:

- Issue permits for protection of drinking water sources through (a) New Source Approval process; and (b) Water Management Act permits for sources pumping more than 100,000 gallons per day, and
- Review and approve source protection plans, including local bylaws.

Assistance:

- Provide:
  - ⇒ technical assistance to communities to develop local source protection plans and to meet state source protection requirements
  - ⇒ training to public water suppliers on a myriad of Safe Drinking Water Assessment programs
  - ⇒ training to local officials on the Underground Injection Control Program
  - ⇒ reimbursement to certified operators of small systems that receive training on source protection or other Safe Drinking Water Assessment programs
  - ⇒ software to public water suppliers to determine reservoir firm yield
- Manage up to $200 million in new Drinking Water State Revolving Fund projects
- Contract with third party providers to assist public water suppliers in technical, financial, and managerial issues relating to compliance with the Safe Drinking Water Act, and
- Distribute quarterly newsletter covering important drinking water topics.

Compliance:

- Conduct:
- Underground Injection Control inspections
- site discovery activities to identify sources or potential sources of contamination to public water supplies
- Publish and post annual Public Water Supplier compliance reports
- Establish contracts with third party technical assistance providers to deliver training and outreach to small water suppliers
- Develop and Implement:
- Capacity Development program
- Consumer Confidence Reporting program
- Certified Operator Training and Evaluation program
- Source Water Assessment Program
- Correct monitoring and reporting violations with appropriate enforcement actions, and
- Implement fully the comprehensive compliance and enforcement strategy for sanitary surveys and all other Safe Drinking Water Assessment programs, following DEP *Enforcement Response Guidelines* and EPA enforcement guidance.

P-A-C-E-R Activities (continued)

Enforcement:

- Follow up on:
- Underground Injection Control inspections with appropriate enforcement actions
- sanitary survey findings with appropriate enforcement action
- capacity deficiencies with appropriate compliance assistance and enforcement action, and
- all water quality violations to ensure that source protection has been implemented.

Regulation development **(includes policy/program development and legislation):**

- Develop and implement new programs:
- Disinfection Byproducts Rule/Interim Enhanced Surface Water Treatment Rule program
- Public notification program
- certified operator training program
- certified operator training reimbursement program
- unregulated contaminant monitoring program
- amend the Massachusetts UIC regulations to be consistent with EPA Class V in order for DEP to retain primacy
- modify source approval process to further ensure resource protection, and
- Work closely with basin teams, technical advisory committees, and workgroups to identify drinking water policy issues for regular revision.

2. Treat water, if required, prior to distribution.

Management Strategies

This is how DEP will ensure that water is treated, if required, prior to distribution:

- Use state Surface Water Treatment Rule Regulations and approved guidance and procedures (including "Measures of Success") for decisions regarding the filtering of surface water sources
- Evaluate:
  - ⇒ all routine water quality monitoring data and determine treatment as needed
  - ⇒ water treatment plants through the Composite Correction Program's Comprehensive Performance Evaluations
  - ⇒ drinking water compliance data and publish in annual *Public Water Suppliers Compliance Report*
- Develop the certified operator training program to adequately train staff
- Reimburse certified operators from small systems that receive training on water treatment
- Implement:
  - ⇒ Comprehensive Compliance and Enforcement Strategy, and
  - ⇒ capacity development regulations.

P-A-C-E-R Activities

We will carry out our management strategies through these activities.

Permitting:

- Review and approve
  - ⇒ new/modified treatment processes
  - ⇒ capacity plans, and
  - ⇒ approve new technology treatment processes.

Assistance:

- Co-sponsor training on treatment technologies for small systems, and
- Utilize in house "circuit rider" staff to evaluate and educate public water systems.

Compliance:

- Review routine monitoring data to determine the effectiveness of treatment or the need for treatment and/or modifications, and
- Continue DEP Composite Correction Program's Comprehensive Performance Evaluations to have all treatment facilities evaluated by the 2000.

Enforcement:

- Take enforcement action against systems that do not comply with treatment requirements.

Regulation development **(includes policy/program development and legislation):**

- Develop and implement regulations for:
  - ⇒ Point of Use/Point of Entry treatment alternatives
  - ⇒ Variances and Exemptions
  - ⇒ Disinfection Byproducts Rule
  - ⇒ Interim Enhanced Surface Water Treatment Rule, and
  - ⇒ Negotiate and implement requirements under the Unregulated Contaminant Monitoring Rule.

3. Protect and maintain water distribution systems.

Management Strategies

This is how DEP will protect and maintain water distribution systems:

- Develop and promote distribution system protection plans (cross connection control)
- Evaluate all public water suppliers for compliance with the new Cross Connection Control Regulations
- Annually audit 20% of all community and non-transient non-community systems for distribution protection control
- Develop the certified operator training program to facilitate adequately trained staff
- Reimburse certified operators from small systems that receive training on distribution system operation and protection
- Implement:
  - ⇒ a comprehensive compliance and enforcement strategy, and
  - ⇒ capacity development regulations to ensure that systems have the technical, financial, and managerial capacity to comply with distribution system requirements for the foreseeable future.

P-A-C-E-R Activities

We will carry out our management strategies through these activities.

Permitting:

- Review and approve:
  - ⇒ distribution protection plans
  - ⇒ capacity plans, and
  - ⇒ operation and maintenance plans.

Assistance:

- Create and distribute a distribution protection guidance and model plan, and
- Use mobilization partners to provide training and technical assistance on the distribution protection guidance and model plan.

Compliance:

- Review:
  - ⇒ cross connection control program plan submittals, take enforcement action as needed, and
  - ⇒ cross connection annual report submissions, and take enforcement action or provide compliance assistance in accordance with the established program plan.

Enforcement:

- Take enforcement action against systems:
- that do not have approved distribution protection program plans
- that have not implemented their programs, and
- with deficient operation and maintenance plans.

Regulation development **(includes policy/program development and legislation):**

- Draft clarification changes to the distribution protection regulations
- Create a distribution protection guidance and model plan, and
- Revise the Drinking Water Regulations to include appropriate SDWA changes and other state-required changes, in particular, capacity and certified operator requirements.

4. Monitor public water supply systems to ensure provision of safe drinking water.

Management Strategies

This is how DEP will monitor public water supply systems:

- Monitor bacteria, turbidity, radioactivity, and chemical levels in water supplies
- Maintain and improve the laboratory certification program (i.e., through outreach and education, audits, on-site inspections, enforcement, and regulatory changes), as part of Quality Assurance/Quality Control program
- Continue comprehensive sanitary survey programs
- Strengthen enforcement with focus on new systems, compliance with new regulations, transient non-community systems (e.g., campgrounds), and unspecified seasonal or pipeline biological contamination
- Work with the Massachusetts Department of Public Health for follow-up of lead in water from homes of lead poisoned children
- Evaluate and act upon inspections of large public water supply systems on a basin-by-basin schedule
- Institute a groundwater monitoring plan for new groundwater sources
- Develop the certified operator training program and capacity development program to facilitate the training of staff and monitoring efficiency, and
- Implement fully the DWP comprehensive compliance and enforcement strategy.

P-A-C-E-R Activities

We will carry out our management strategies through these activities.

Permitting:

- Certify laboratories analyzing public water supplies
- Review and approve:
  - ⇒ new or revised sampling plans for public water suppliers
  - ⇒ capacity plans, and
  - ⇒ new or revised staffing plans for public water suppliers to ensure that all operators are certified and trained.

Assistance:

- Provide or co-sponsor one annual training for certified laboratories
- Reimburse certified operators from small systems that receive training on water quality sampling and monitoring
- Co-sponsor training on sample collection protocols for Public Water Supplier staff, and
- Continue to chair the Board of Certification and ensure that Massachusetts has a certification program that meets the Safe Drinking Water Act requirements.

P-A-C-E-R Activities (continued)

Compliance:

- Track sanitary survey information currently located in the Water Quality Testing data management system on a monthly basis, ensuring compliance in 60-90 days for non-health-related issues; address immediately any situations that cause a public health threat
- Report all violation and inventory updates to EPA on a quarterly basis
- Continue conducting Comprehensive Compliance Evaluation inspections
- Perform EPA Priority 1 baseline activities for bacteria and chemical monitoring
- Work with the Massachusetts Department of Public Health to keep track of, evaluate, and investigate all potential waterborne disease outbreaks
- Conduct other inspections to:
  - ⇒ follow-up on compliance issues identified in previous inspections
  - ⇒ investigate complaints
  - ⇒ investigate patterns of noncompliance
  - ⇒ implement other initiatives
- Perform on-site audits and compliance follow-up of:
  - ⇒ 10-15 microbiology laboratories if resources are available, with priority given to those that have reported drinking water analyses data within the last 3 years. EPA has been notified that DEP's Laboratory Certification Office (LCO) has had significant reduction in its microbiology certification staff resulting from the resignation of one staff member and the emergency deployment of another to the MADPH Anthrax Monitoring Effort. DEP will respond under separate cover as to its plan to perform on-site audits for microbiological laboratories
  - ⇒ 25-30 chemistry laboratories, with priority given to those that have reported drinking water analyses data within the last 3 years
- The Laboratory Certification Office (LCO) will conduct additional on-site inspections of microbiology and chemistry laboratories with recurring reporting and analysis problems that are referred to the LCO by the Drinking Water Program; at least 26 microbiology laboratories will be inspected by December 31, 2002, and at least 36 microbiology laboratories will be inspected by December 31, 2003
- Establish contracts with third party consultants to provide one-on-one site visits to small water supplies
- Provide individual sample schedules to each Public Water Supplier in the state, and
- Sponsor small Public Water Supplier mentoring cooperatives.

Enforcement:

- Increase enforcement for transient non-community systems
- Follow-up audits and inspections of certified laboratories with appropriate enforcement actions, and
- Implement fully the comprehensive compliance and enforcement strategy for sanitary surveys and all other Safe Drinking Water Act programs, following DEP *Enforcement Response Guidelines* and EPA enforcement guidance.

P-A-C-E-R Activities (continued)

Regulation development (includes policy/program development and legislation):

- Revise:
- Laboratory Certification program and regulations, and
  - ⇒ Drinking Water Regulations to include appropriate Safe Drinking Water Act changes and other state required changes.

Other:

- Implement the plan for meeting the requirements for a laboratory certification program equivalent to EPA's, in accordance with the National Primary Drinking Water Regulations. This plan will ensure that all in-state certified laboratories are inspected once every three years, while addressing both the national effort for accreditation of environmental laboratories and DEP's plan for revising and potentially expanding its laboratory certification program.

5. Ensure public water supply systems are operated and managed well.

Management Strategies

This is how DEP will ensure public water supply systems are operated and managed well:

- Increase registration and oversight of previously unregistered public water supplies by initiating registration for all identified unregistered systems
- Provide:
  - ⇒ training and education for system operators and owners
  - ⇒ technical and compliance assistance to public water suppliers on all issues including boil water orders
  - ⇒ capacity development training and outreach to water systems
- Fully implement an operator certification program
- Develop the certified operator training program to facilitate adequately trained staff and management effectiveness
- Develop and implement the certified operator training reimbursement program for the certified operators from small systems to encourage adequate training
- Implement capacity development regulations to ensure that systems have the technical, financial, and managerial capacity to comply with the SDWA requirements for the foreseeable future
- Assist water systems in developing Consumer Confidence Reports
- Implement fully DEP's comprehensive compliance and enforcement strategy, and
- Update the *Guidelines and Policies for Public Water Systems* to incorporate all changes in guidelines and policies. These guidelines will also reflect the analysis of impacts to sensitive receptors from groundwater withdrawals.

P-A-C-E-R Activities

We will carry out our management strategies through these activities.

Permitting:

- Increase registration and oversight of previously unregistered public water supplies through a cooperative program between DEP and local Boards of Health
- Provide capacity development reviews on each application for a new system/source and during sanitary survey (comprehensive compliance evaluation) review for existing systems
- Review and classify all PWS treatment plants as required by SDWA
- Review and approve:
  - ⇒ operation and maintenance plans for public water suppliers
  - ⇒ certified operator staffing plans for public water suppliers
  - ⇒ capacity plans, and
  - ⇒ training courses for credit for operators of drinking water systems.

P-A-C-E-R Activities (continued)

Assistance:

- Sponsor opportunities for training and educational programs owners and operators of Public Water Supplies
- Distribute a quarterly newsletter, *In the Main*
- Develop training brochures and other materials on needed drinking water information, e.g., capacity development, Consumer Confidence Reporting, etc.
- Work with the Board of Certification of Operators of Water Supply Facilities in training operators seeking certification; offer "training contact hours" credits for operator training and education
- Increase compliance assistance for transient non-community systems through our mobilization partners
- Provide technical assistance, mentoring opportunities, and training to public water systems, with priority given to existing systems experiencing capacity problems
- Conduct source water protection outreach, including dissemination of new documents (wellhead protection manual, Underground Injection Control guide, hazardous materials guide, surface water protection guidance), and
- Support PWS with fact sheets and information to help them respond to consumer questions/requests as a result of new rules, programs or revised regulations.

Compliance:

- Continue comprehensive sanitary surveys of community and non-transient non-community systems according to the river basin schedule, including capacity assessment and assurance, and distribution protection evaluation for all public water supplies, and
- Do not approve the creation of new public water systems that lack the technical, managerial, or financial capacity to comply with the SDWA requirement in the foreseeable future.

Enforcement:

- Take enforcement action against systems that do not comply with registration requirements, capacity requirements, sanitary survey violations or other SDWA violations.

Regulation development **(includes policy/program development and legislation:**

- Finalize the capacity development program guidance of water system mangers training
- Prepare draft strategy on incorporating Environmental Management Systems into the Drinking Water Program compliance strategy, and
- Draft and implement standard operation procedure to evaluate drinking water treatment plant sludge and its subsequent disposal.

6. Increase public awareness about safe drinking water.

Management Strategies

This is how DEP will increase public awareness about safe drinking water:

- Provide or co-sponsor training and education for the general public
- Train public water suppliers to implement local public education and awareness programs
- Develop the certified operator training program to facilitate adequately trained staff and management capacity
- Revise the public notification program to facilitate education and awareness of the public
- Use the Massachusetts Educational Partnership to develop and implement a public awareness outreach strategy
- Utilize Source Water Assessment Program assessments to educate the public and local officials on water supply protection issues
- In order to educate and provide public awareness on drinking water issues DEP will use:
  - ⇒ consumer confidence reporting and annual compliance reporting processes required by the Safe Drinking Water Act
  - ⇒ the revised public notification process
  - ⇒ the *In the Main* newsletter
  - ⇒ the publication *Massachusetts Drinking Water Standards and Guidelines for Chemicals in Massachusetts Drinking Waters*
  - ⇒ DEP's web site
  - ⇒ the regulation development process
  - ⇒ Drinking Water Week activity
  - ⇒ the annual Drinking Water Compliance Awards
  - ⇒ the State Revolving Fund Source Water Assessment Program
  - ⇒ enforcement actions
  - ⇒ the capacity development program, and
  - ⇒ where appropriate, seed money for regional entities to establish outreach efforts.

P-A-C-E-R Activities

We will carry out our management strategies through these activities.

Permitting:

- Review and approve each public water supplier distribution protection (cross connection control) outreach strategy, and
- Review and accept public water supplier consumer outreach programs for credit in the annual Compliance Award Program.

P-A-C-E-R Activities (continued)

Assistance:

- Encourage public notification and outreach by all public water suppliers by providing training opportunities and outreach materials for their use
- Continue the Annual Public Water Supply Compliance Awards program
- Sponsor or co-sponsor drinking water awareness events throughout the year
- Provide:
  - ⇒ training on Consumer Confidence Reporting
  - ⇒ support resources for PWS to assist in their response to consumers, and
  - ⇒ user-friendly public notices to all PWS for efficiency of usage.

Compliance:

- Ensure all systems are complying with the Consumer Confidence Reporting and public notification requirements.

Enforcement:

- Take enforcement action against:
  - ⇒ all systems that do not comply with the public notification requirement, and
  - ⇒ all public water suppliers that do not comply with the Consumer Confidence Report requirements.

Regulation development **(includes policy/program development and legislation):**

- Implement new SDWA public notification regulations and program.

7. Incorporate new federal primacy requirements.

Management Strategies

DEP will incorporate new federal primacy requirements by implementing requirements and developing and promulgating appropriate changes to drinking water related regulations.

P-A-C-E-R Activities

We will carry out our management strategies through these activities.

Permitting:

- Approve disinfection-by products reduction plans.

Assistance:

- Provide pre-regulation information to all public water suppliers.

Compliance:

- Sponsor training on all new federal rules.

Enforcement:

- Establish enforcement procedures in accordance with the DEP *Enforcement Response Guide* for all newly implemented rules, which include disinfection by-product rule and public notification.

Regulation development **(includes policy/program development and legislation):**

- Develop and promulgate appropriate changes to drinking water regulations as required by Safe Drinking Water Act and other state requirements (disinfection by product rule, radionuclides, public notification, etc.), and
- Develop and promulgate appropriate changes to the Underground Injection Control Regulations as required by the federal Class V Rule and other state requirements.

Table 2: Environmental Indicators and other Performance Measures associated with the Goal to "Ensure that every public water supply consistently provides water that is safe to drink."[3]

Environmental Indicators
• *# of : a) community drinking water systems and % of population served by community water systems, and b) non-transient, non-community drinking water systems, and % of population served by such systems, with no violations during the year of any federally enforceable health-based standard (EPA will develop language clarifying meaning of federally enforceable)*
• # of waterborne disease outbreaks (*Cryptosporidium, Giardia, enteric virus and bacteria*)
Program Outcomes
• *Estimated number of community water systems (and estimated % of population served) implementing a multiple barrier approach to prevent drinking water contamination (EPA and States will expeditiously define "multiple barrier approach").*
• # of newly identified systems with MCL violations
• # and % of systems with boil orders for bacteria that are returned to compliance
• # and % of systems with improved capacity
• # and % of systems with certified operator
• # and % of systems who completed Consumer Confidence Reports
• # and % of systems exceeding the lead action level
• # and % of exceedances of the Action Level for lead resolved as a result of the DEP/DPH Referral Program for Lead Poisoned Children
• # and % of systems with approved distribution protection plans
Program Outputs
• # of Comprehensive Compliance Evaluations (CCEs)
• # of sanitary surveys
• # of UIC inspections
• # of on-site laboratory audits
• # of laboratories certified for microbiological and chemical analyses under the SDWA certification program
• # of capacity development reviews
• # of operators certified or re-certified
• # of water quality monitoring reports reviewed
• # of monitoring waivers reviewed and granted
• Regulatory changes
• Increased level of enforcement
• Technical assistance to public water suppliers
• # of loans to assist in achieving compliance with SDWA requirements
• # of protection plans reviewed and approved for new sources
• # of source water assessments
• # of Water Management Act permits for sources pumping more than 100,000 gallons per day

[3] Items that are italicized are Core Performance Measures, except species names.

Achieve Clean Water and Protect Aquatic Ecosystems

Clean Water Goal #2: Reduce, eliminate, and/or control both point and nonpoint discharges to surface and groundwater

Achieve Clean Water and Protect Aquatic Ecosystems

Clean Water Goal #2: Reduce, eliminate, and/or control both point and nonpoint discharges to surface and groundwater

A. Self Assessment

1. Status of Water Resources

Why is it important to protect surface and groundwater?

Water quality protection is of the utmost importance to protect existing and future drinking water supplies and to achieve the designated goals for our surface waters. Those goals include but are not limited to:

- Providing suitable water quality conditions for the survival and reproduction of aquatic flora and fauna
- Providing adequate water quality for recreational activities such as swimming, boating, and fishing by decreasing the risk of exposure when coming in contact with the water, and
- Providing protection of fish and wildlife and the public who may consume them by ensuring fish and shellfish remain edible.

What is the status of rivers and streams?

In Massachusetts, 1,496 river miles of the state's 8,229 total river miles (18%) were assessed in the 2000 305(b) Report for one or more of their designated uses (see Figure 1). The assessed river miles comprise the major mainstem rivers in the state and those tributaries with major point sources of pollution. These rivers are the most visible and flow through the major population centers of the state. The 82% of river miles that are unassessed consist largely of small headwater streams and minor tributaries with no known or suspected pollution problems. From a point source pollution perspective these streams could be assumed as supporting their uses. However, this assumption is not always valid because some of these streams may be impacted by nonpoint pollution..

What is DEP's assessment of rivers?

Figure 1 provides a graphic summary of the number of river miles assessed, level of overall use support and a breakdown of the percentage of assessed miles based on individual use.[4] Waters are prioritized and assessed based on concerns expressed by stakeholders in each watershed, the need to verify that waters should either be added or deleted from the list of impaired waters, known or suspected water quality and/or pollution problems and the need to collect data for purposes of implementing and monitoring Total Maximum Daily Loads (TMDLs).[5] Figure 2 illustrates the causes of impairment and potential sources versus the percentage of miles assessed.

[4] Figures 1 through 6 are taken from the 2000 Summary of Water Quality Report (305(b)). Note that in certain cases percentages of these figures add to more than 100% because rivers, lakes, and marine waters can have multiple causes and sources of nonsupport and impairment. In the case of lakes (Figure 4), sources of impairment total only 60% because 40% of assessed lakes are not impaired. In Figures 1, 3, and 5, individual use totals may not equal 100% due to rounding. Also in Figures 1, 3, and 5, the "Level of Overall Use Support" pie chart does not show an average of individual use percentages. Instead, the chart shows percentages of assessed river miles fully, partially, or not supporting *one or more uses*, including some uses not listed at the bottom of the page.

[5] Under Section 303(d) of the federal Clean Water Act, states are required to develop a list of impaired waterbodies and TMDLs, which are estimates of the maximum amount of pollution allowed for each impaired waterbody. TMDLs are then used to make decisions on permits, enforcement action, and priorities for inspections.

What are the causes of continued impairment? How are they being addressed?

Quantifying and eliminating known impairments will require targeting different types and sources of pollution. Nutrients from point and nonpoint discharges, bacterial contamination in nonpoint sources from stormwater runoff and combined sewer overflows, and toxic contamination in sediments (largely historical) prevent the remaining river miles from meeting their goal. Bacteria impact over half of the rivers assessed and are largely attributable to stormwater runoff and combined sewer overflows (CSO). The CSO problem is being aggressively addressed by ongoing abatement and enforcement programs. The larger problem of abating nonpoint source pollution as well as excessive nutrient discharges require new approaches to remediation that are incorporated in the Watershed Approach and TMDL programs. Toxic pollutants contaminating sediments and moving up the food chain into fish tissue poses another problem demanding nontraditional solutions. The contamination appears to be largely historical. Better definition of the nature and extent of the problem, more data, and better assessment tools are needed before suitable abatement measures can be selected.

Isolated cases of municipal and industrial point source problems still persist that point to the importance of compliance and enforcement of National Pollution Discharge Elimination System (NPDES) permits as well as the larger issue of ensuring proper operation and maintenance of existing wastewater treatment facilities.

What has happened to the water quality of rivers in the past three decades?

The river cleanup program has enjoyed enormous success. More than half of the river miles assessed now support aquatic life, swimming and boating, with the qualification that half of the swimmable miles still experience some intermittent problems. The significance of this information is that swimming and fishing in most of these waters would have been unthinkable 25 years ago. This highlights the success of the industrial and municipal point source cleanup program. In particular, the state's Municipal Facilities Program directed nearly 4 billion dollars of federal and state funds since 1967 in achieving this progress. Currently, there are 116 Publicly Owned Treatment Works (POTWs) that treat over a billion gallons of sanitary and industrial wastewater each day and serve 70% of the state population.

Table 3: Water Quality Definitions

Designated beneficial use, designated use, or individual use is a desirable use that water quality should support. The uses listed below are employed by the Massachusetts DEP to help define water quality conditions. Each designated use has a unique set of water quality requirements or criteria that must be met for the use to be realized.

Use	Definition
Aquatic Life Support	The waterbody provides suitable habitat for protection and propagation of desirable fish, shellfish, and other aquatic organisms.
Fish Consumption	The waterbody supports fish free from contamination that could pose a human health risk to consumers.
Primary Contact Recreation - swimming	People can swim in the waterbody without risk of adverse health effects from ingestion or contact with the water.
Secondary Contact Recreation	People can perform activities on the water (such as boating) without risk of adverse human health effects from ingestion or contact with the water.

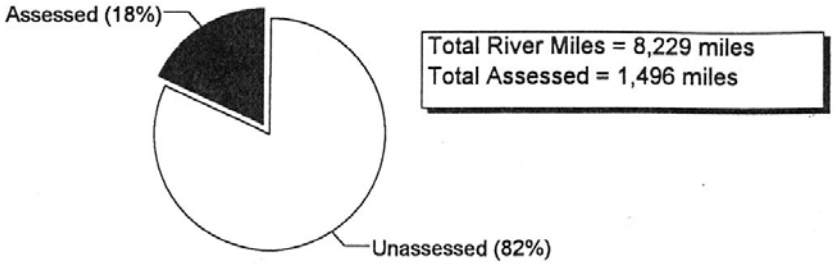
Levels of Use Support are assigned by the Massachusetts DEP to each waterbody. The level of use support is determined by comparing monitoring data with numeric criteria for each use designated for a particular waterbody.

Use Support Level	Water Quality Condition; Determination	Definition
Fully Supporting	Good; All designated beneficial uses are fully supported.	Water quality meets designated use criteria.
Partially Supporting	Fair (Impaired); One or more designated beneficial uses are partially supported and the remaining ones are fully supported.	Water quality fails to meet designated use criteria at times, and/or the data collected was insufficient or inconclusive for full support determination.
Not supporting	Poor (Impaired); One or more designated beneficial uses are not supported.	Water quality frequently fails to meet designated use criteria.

Figure 1

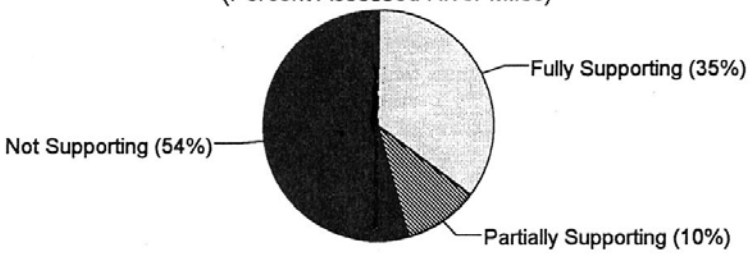
River Assessment

River Miles Assessed



Level of Overall Use Support

(Percent Assessed River Miles)



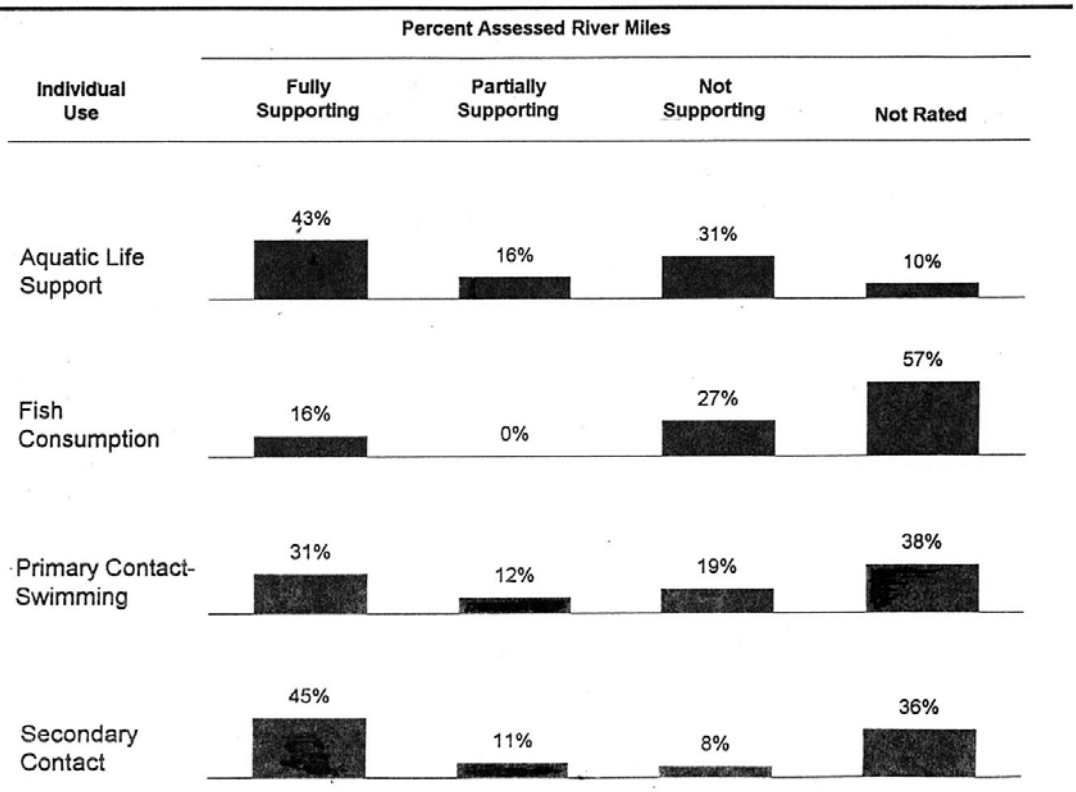
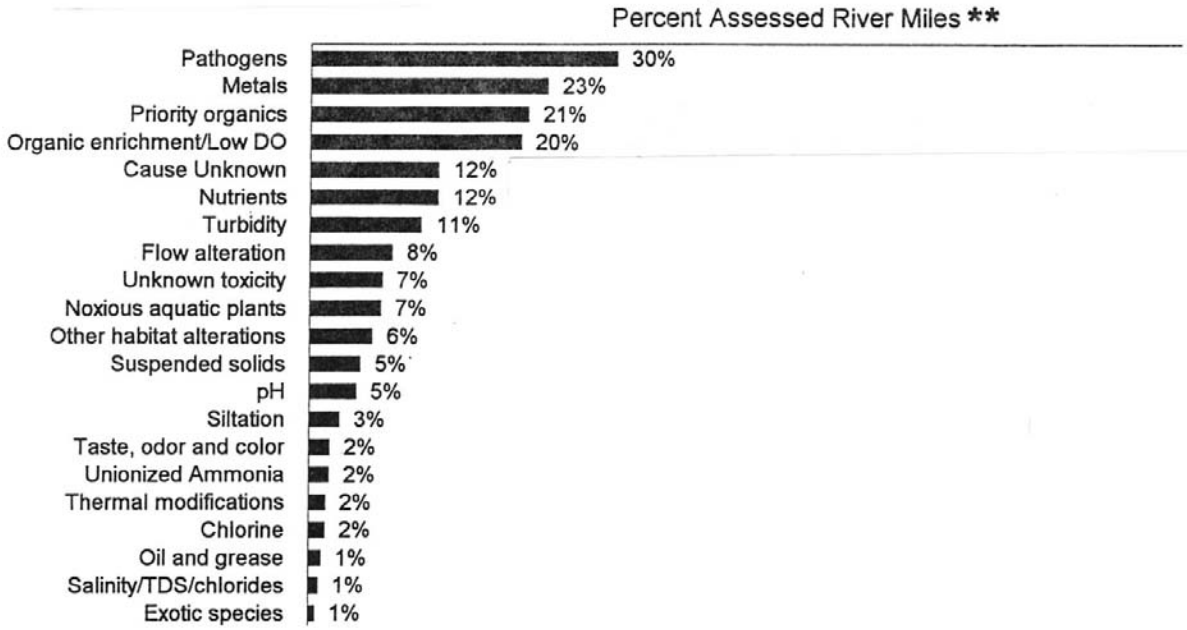


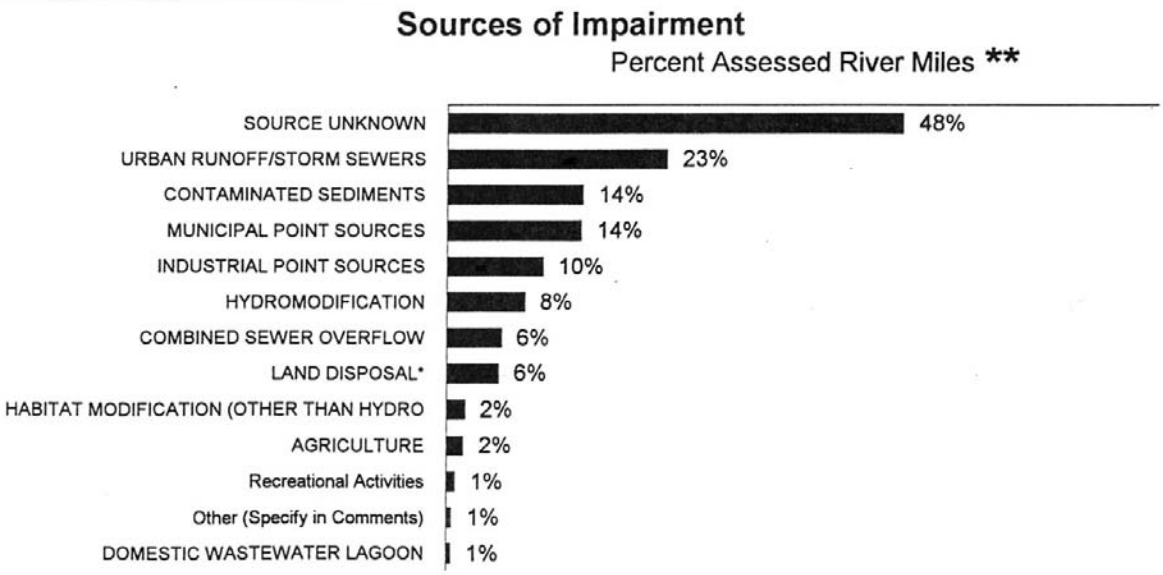
Figure 2

River Assessment

Pollutants/Causes of Impairment



Sources of Impairment



*-Includes onsite wastewater systems

** -River Miles Assessed = 1,496 miles

What is the status of lakes?

Fifty-four percent of the total 151,173 acres of lakes in Massachusetts are currently assessed. Figures 3 and 4 provide a graphic summary of the lake assessment results. Source identification of pollutants is not presently part of the lake assessment program. It is hoped that the Watershed Approach and TMDL programs will assist the DEP in identifying many of these potential sources in the coming years.

What is DEP's assessment of lakes?

Forty-one percent of the acres assessed fully supported all their uses; about 32 % of acres assessed partially supported their uses, and approximately 27% did not support any of their uses. Of the individual use categories (aquatic life, fish consumption, primary contact, and secondary contact), only secondary contact recreation was well supported (71%). Other uses indicated much lower levels of full support, however less total acres were evaluated for the different uses. These changes reflect the shift in focus of the DEP's lake monitoring from the detection of eutrophication problems to the documentation of aquatic plant cover and the presence of nonnative species populations. Forty percent of the acreage assessed only partially supported the aquatic life use.

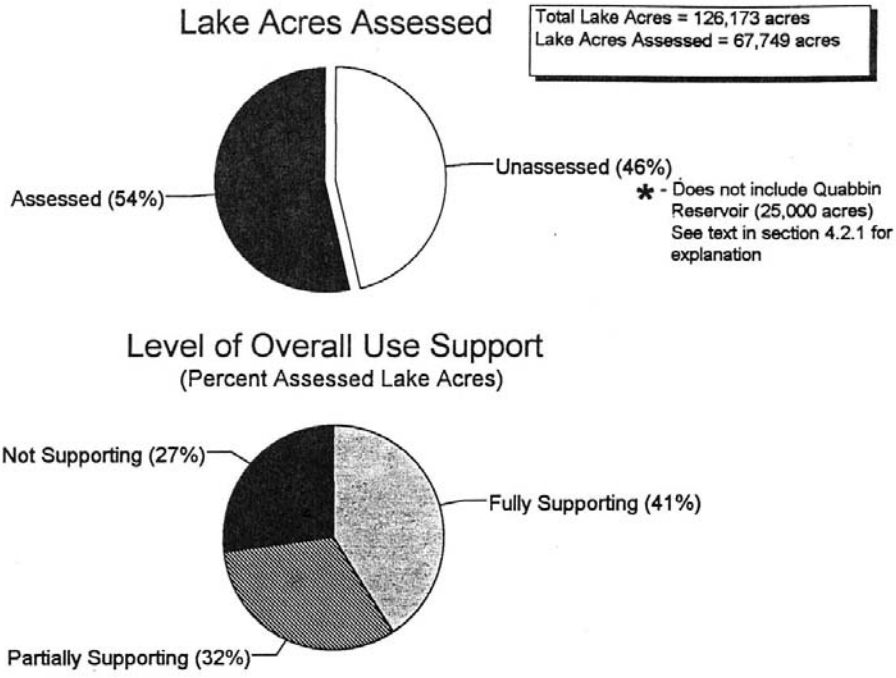
What are the symptoms and causes of continued impairment? How are they being addressed?

The symptoms of impairment include an imbalance of macrophyte communities (with plants such as water lilies and bladderworts) due to the presence of nonnative plant species (such as eurasian milfoil and water chestnut), the proliferation of aquatic plants in general, and excess metals (associated with the bioaccumulation of mercury in fish). Non-native species are undesirable because they out-compete native species of plants, reduce diversity and have other negative effects on the biota of a waterbody.

The causes of these stressors are largely unknown, although nonpoint sources, including stormwater runoff and on-site wastewater systems, are largely suspected to add additional nutrients that result in the proliferation of plants. The sources of mercury are thought to be primarily from in-state and out-of-state air deposition from power plant emissions and municipal waste combustors.

Pollutant discharges from on-site wastewater treatment systems are being addressed through the implementation of revised Title 5 regulations, which now require periodic inspections and upgrades where systems are found to be failing. Stormwater runoff is being presently being addressed by continued implementation of stormwater Best Management Practices. Future activities to address the issue will include the development of TMDLs and implementation of the new EPA Phase 2 stormwater rules. These initiatives should reduce impairment of lakes and other surface and groundwaters. See "Emissions and Deposition of Toxic Air Pollutants" under part 2e of the National Air Strategy Goal for more information on mercury in the environment and what is being done to address this problem.

Figure 3
Lake Assessment*



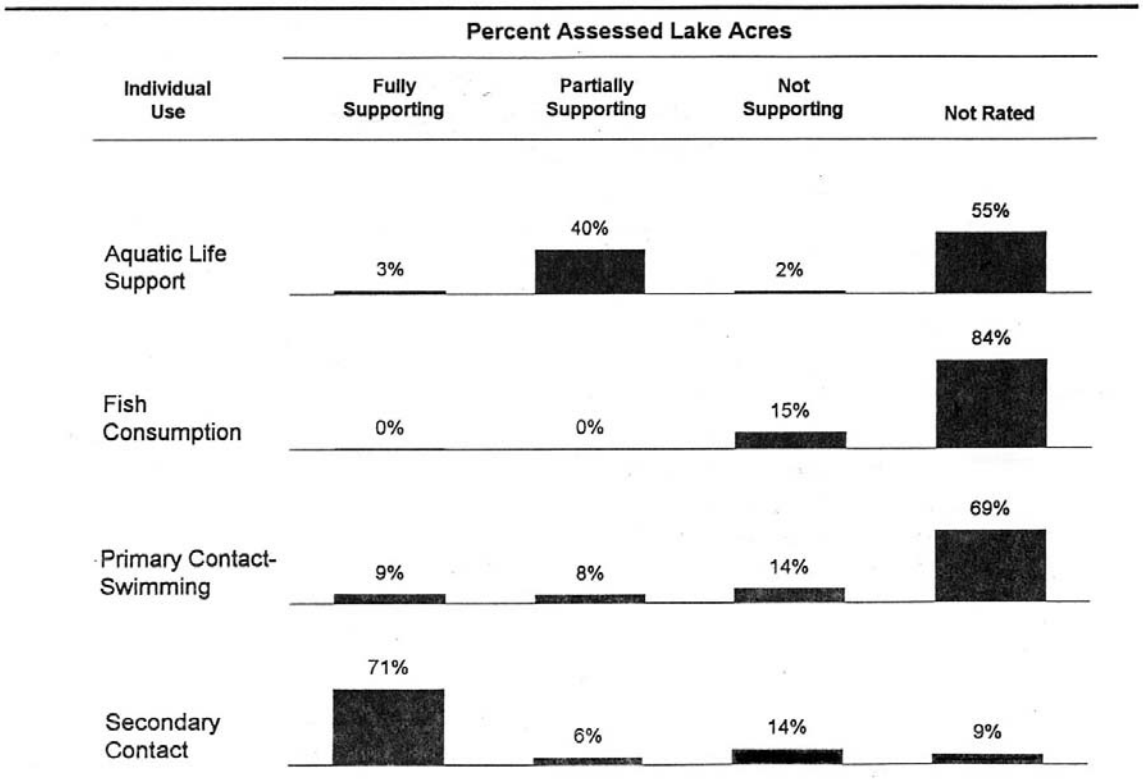
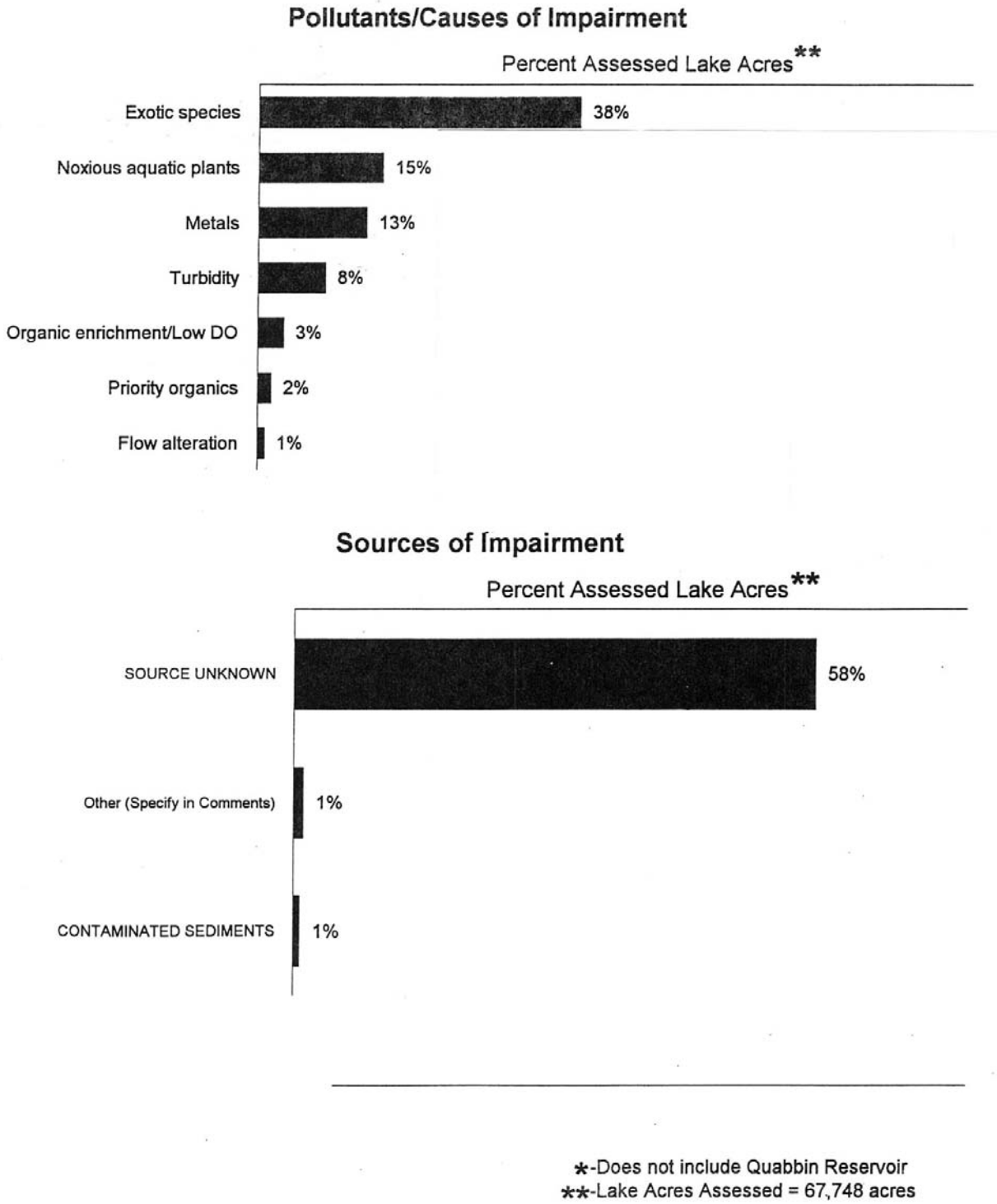


Figure 4
Lake Assessment*



*-Does not include Quabbin Reservoir
**-Lake Acres Assessed = 67,748 acres

What is the status of marine waters?

In Massachusetts, 128 square miles (5%) of marine waters were assessed in the 2000 305(b) Report. DEP's assessment (Figures 5 and 6) is heavily biased toward areas that were previously polluted. Over half (55%) of the assessed marine waters did not support one or more of their designated uses. Since the DEP's assessment concentrates on near shore areas of harbors and bays, the overall quality of coastal waters is better than one would observe looking only at the DEP's data. Data from the Division of Marine Fisheries cover a much larger portion of open ocean waters. Their data indicate approximately 9% of the coastal waters assessed did not support shellfishing. Since shellfishing demands a high level of water quality it can be assumed that the overall quality of coastal waters is underestimated by this assessment. Eutrophication is coastal embayments is another growing issue. DEP is presently developing a plan to assess a large number of embayments in southeastern Massachusetts.

What is DEP's assessment of marine waters?

The assessment shows that marine waters are lagging behind the river cleanup. Only 36% of the assessed waters fully supported all of their uses. However, all the major urban areas on the coast are either in facilities planning or construction phases of new cleanup efforts. Foremost among these is a massive project to clean up Boston Harbor. Sewer system rehabilitation and improvements in sludge handling have already made positive impacts on the waters of Boston Harbor.

When uses are examined individually, 11% of the assessed waters support aquatic life fully. About half of the waters fully or partially support primary and secondary contact recreation.

What are the causes of continued impairment? How are they being addressed?

The major cause of nonsupport in marine waters is bacterial contamination. This is the cause of impacts in about two-thirds of the waters assessed. The predominant sources of these bacteria are stormwater runoff (31%) and combined sewer overflows (25%) although other sources may contribute. Cleanup of combined sewer overflows is underway in many locations. Cleanup of stormwater runoff will result from implementation of the new EPA Phase 2 Regulations. However this will take some time.

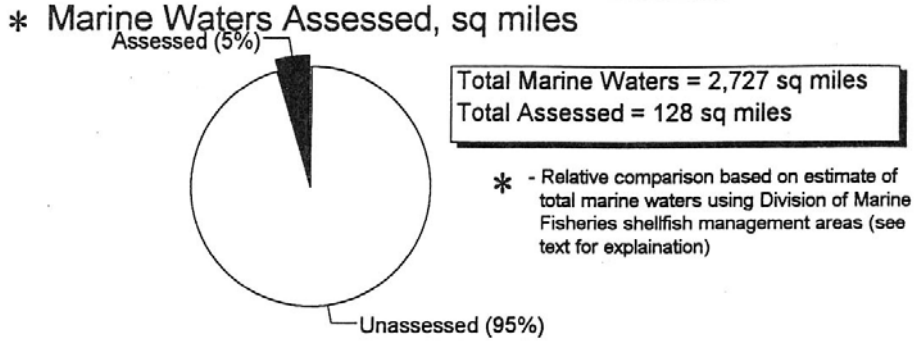
Toxic contamination of marine waters is demonstrated by areas of contaminated sediments in Boston Harbor, Quincy Bay, areas of the North Shore and Buzzards Bay. These are areas of historical pollution and pose special problems for cleanup efforts, but experience gained in the ongoing Buzzards Bay cleanup may provide insight for future efforts.

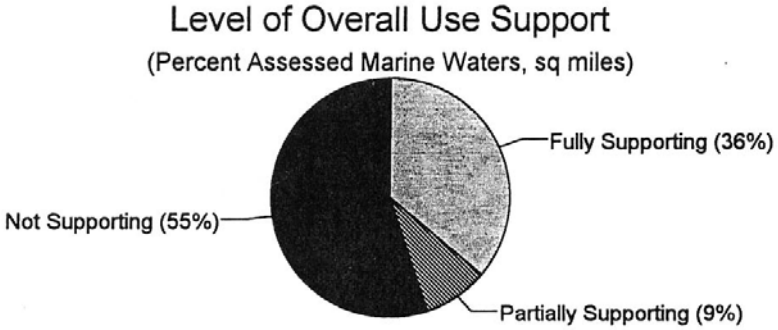
Municipal point sources impact 10% of the waters assessed. Those impacts include nutrient enrichment and toxicity from ammonia. Facilities planning in the major urban areas should correct these problems.

Approximately 48% of the waters assessed are impacted from unknown sources. The complexity of marine hydrology sometimes makes it difficult to attribute cause and effect. As previously noted DEP is currently developing a strategy to assess many coastal embayments in southeastern Massachusetts to determine the extent of the problem and to develop modeling approaches which can be used for determining remedial actions.

Figure 5

Marine Waters Assessment





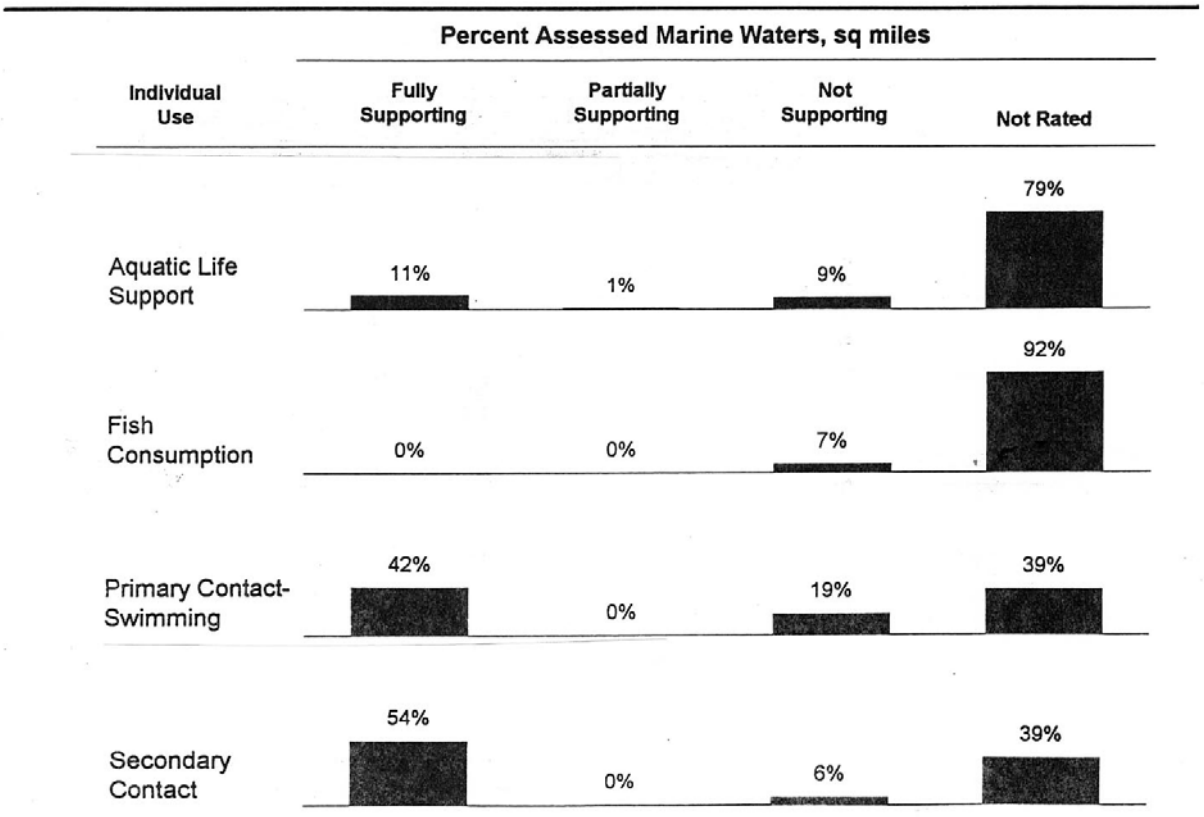
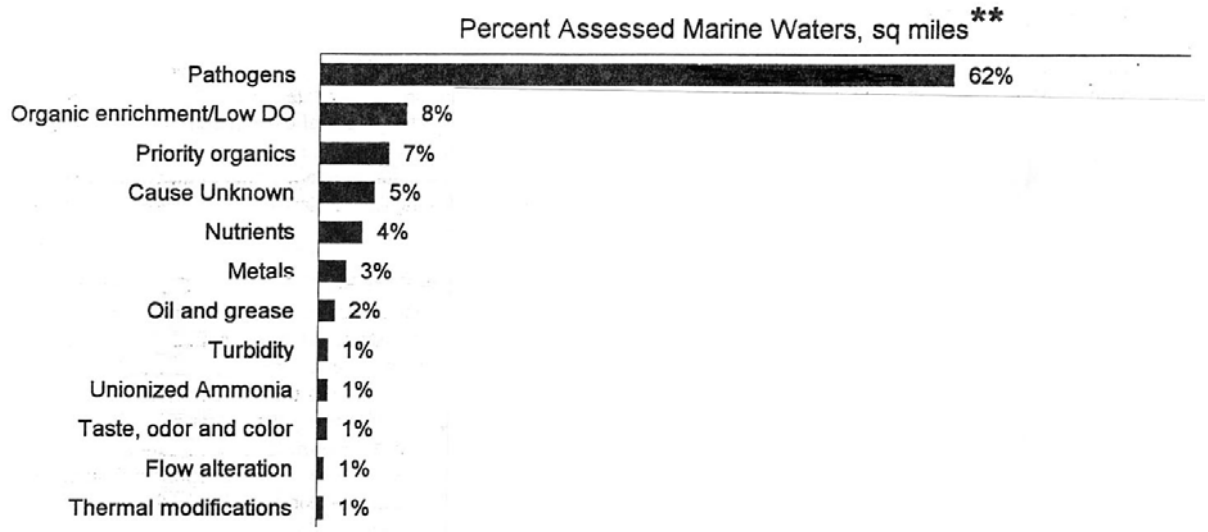
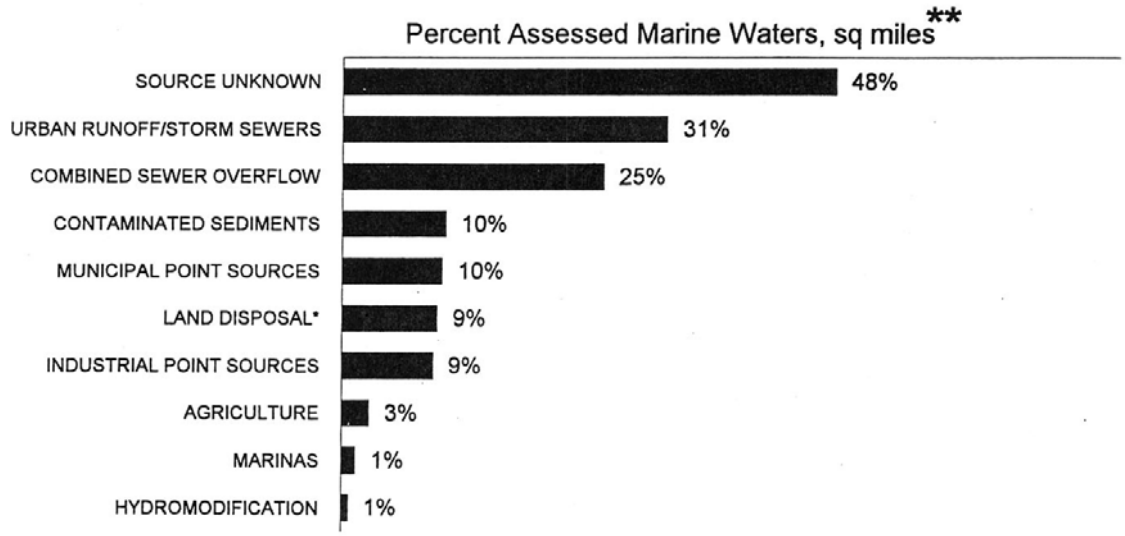


Figure 6
Marine Waters Assessment

Pollutants/Causes of Impairment



Sources of Impairment



* -Includes onsite wastewater systems

** -Marine Waters Assessed = 128 sq miles

Why is acid deposition important?

Acid deposition is a result of the return to the ground of manmade and natural materials which are added to the atmosphere. Power plants and automobiles, which burn fossil fuels such as coal and oil products, release large amounts of sulfur dioxide and nitrogen dioxide into the atmosphere. These particles are transported by the winds and can travel great distances. When they come into contact with the water droplets in clouds, chemical reactions can occur, resulting in acid deposition when it rains or snows. Studies have linked acid deposition with the deterioration of the ecosystems of lakes and forests. Acid deposition also speeds up the decay of historic buildings and monuments and damages materials such as iron, steel and paint.

What is DEP doing to monitor acid deposition?

DEP collaborates with the National Atmospheric Deposition Program to monitor acid deposition. Data is collected at sites in Truro, Waltham and Ware. Figures 7 and 8 show fifteen-year trends using the data from the three Massachusetts sites.

Is pH increasing or decreasing?

Figure 7 shows the trend from 1985 to 2000 for pH of precipitation, which is an indicator of acidity. In 1997 the pH decreased, a change from the overall trend in which pH has increased. A higher pH indicates that precipitation is becoming less acidic, which is a positive trend towards minimizing ecological and other impacts.

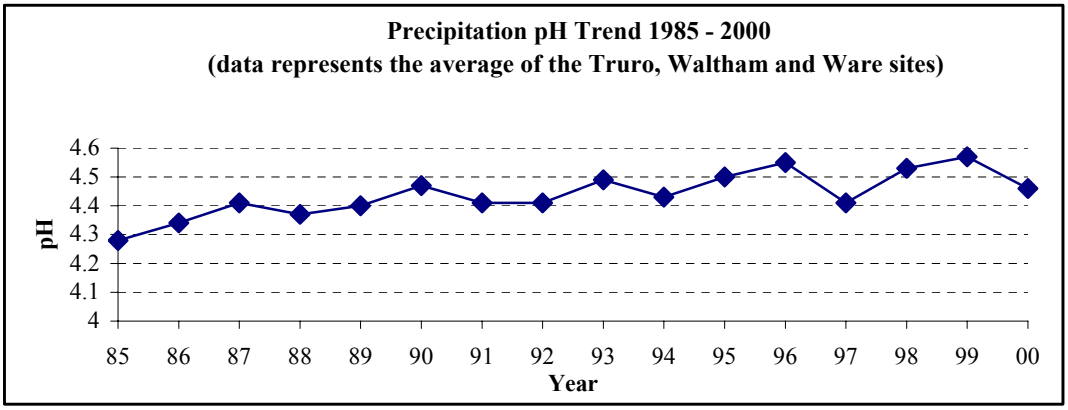


Figure 7

What are the trends for some other types of deposition?

Figure 8 shows the trends for some compounds that affect the quality of surface waters. Nitrate increases acidity and can cause algae blooms and sulfate increases acidity. The data indicates the trends are downward for sulfate and relatively stable for nitrate.

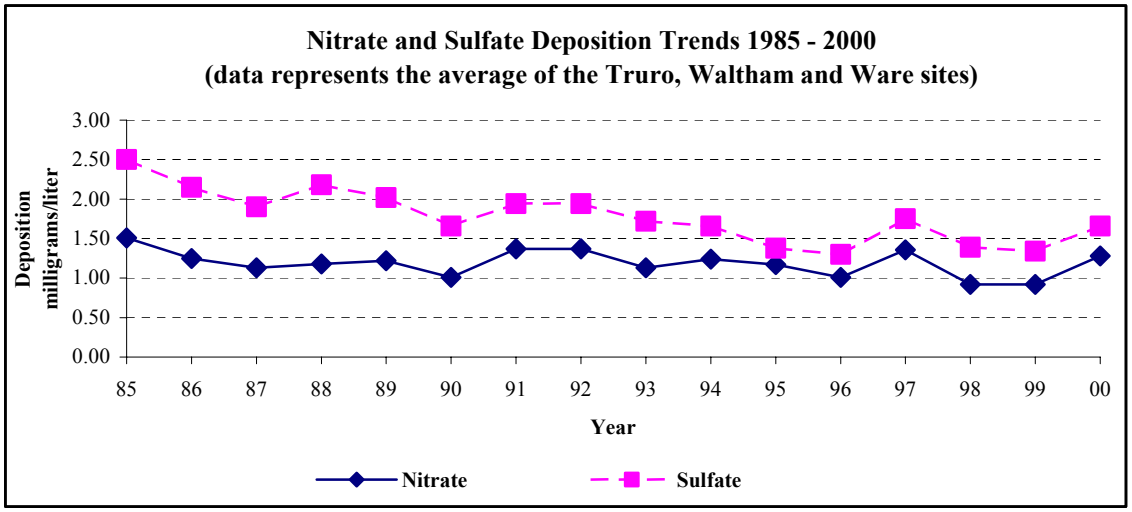


Figure 8

What is DEP doing to mitigate acid deposition?

DEP is trying to reduce acid deposition in several ways. In October 1999, Massachusetts and New York petitioned EPA to establish secondary national ambient air quality standards for sulfur dioxide and nitrogen dioxide. While primary air quality standards are set to protect public health, secondary standards are designed to protect the environment. Ambient air emission reductions needed to meet new, stringent secondary standards would help to reduce acid deposition in Massachusetts and across the nation. Massachusetts is also a signatory to the New England Governors and Eastern Canadian Premiers Acid Rain Action Plan, and intends to meets the goals of that plan, i.e., significant additional reductions in acid deposition by 2010.

For what chemicals have freshwater fish consumption advisories been issued?

Public health freshwater fish consumption advisories have been issued for:

- mercury at 85 waterbodies
- PCBs, at 16 waterbodies
- pesticides, at 3 waterbodies
- dioxin, at 2 waterbodies, and
- PAHs, at 1 waterbody.

A statewide advisory cautioning pregnant women of the possible health risks from eating Massachusetts freshwater fish containing mercury has also been issued.

2. Programs

What does DEP need to do to reduce, eliminate and/or control discharges?

The strategies DEP employs to achieve its goal of resource protection are action items that include:

- implementation of watershed-based assessment monitoring, permitting, compliance, enforcement, public outreach, and nonpoint source control
- control of inland and coastal nonpoint pollution sources, and
- improvement of wastewater treatment and management.

What is the Watershed Approach?

The main strategy employed by DEP to protect and maintain water quality is the implementation of the Watershed Approach. A phased program for watershed-based assessment, permitting, outreach and nonpoint pollution control has been adopted by BRP to address its Watershed Management goals. The program runs its full course over a five-year cycle, then repeats.

What happens in Year 1?

During Year 1, existing water resource information is reviewed and water quality issues are identified to establish the basis for planning activities in subsequent years, build local capacity and support, and identify data gaps that need to be filled. As a priority, DEP regional offices work with the watershed teams, outside agencies, groups, and the general public in order to gain insight with respect to water quality goals and use objectives for Massachusetts surface waters, and to build networks of stakeholders who play an important role in protecting these waters. Outreach to the public through the watershed teams is an integral component of the Year 1 activities.

What happens in Year 2?

During Year 2, water quality surveys are conducted including physical, chemical, biological and fish data collection efforts. These activities are conducted according to the 5-year watershed cycle in the Year 2 watersheds. The goal to fill information gaps and to collect important data for assessing our waterbodies, identifying impaired waters, developing TMDLs and ultimately to make enforcement and permitting decisions. The scope of these field assessments varies depending upon the resources available and the important water quality issues within each watershed. DEP also works through the EOEA watershed teams (see next page) to identify volunteer groups and their capabilities to assist in data collection activities.

What happens in Year 3?

During Year 3, survey data is analyzed as a prerequisite to issuing permits the following year. These include, where applicable, calculation of total maximum daily loads and an evaluation of water quality conditions to update federal 303(d) Lists and 305(b) Reports. DEP also develops a water quality assessment report for each basin during this time. These plans, which evaluate water quality on a segment-by-segment basis are used by DEP and the watershed teams to guide them in identifying potential sources of impairment. The plans also provide recommendations for additional data collection activities for DEP, other federal and state agencies, and volunteer groups serving on the watershed team.

What happens in Year 4?

During Year 4, the assessments are used and incorporated by the EOEA teams into their 5-year action plans that prioritize future actions to be taken by the team to resolve outstanding issues. DEP also independently develops an action plan to address issues under our authority. In addition, meetings with permittees are held and final wastewater and water withdrawal permits are re-issued. Dischargers in priority waters exhibiting nonpoint pollution problems are targeted for implementation of Best Management Practices (BMPs) and other control measures. DEP's Watershed Action Plans include the activities required of DEP to implement the recommendations of the EOEA Watershed Management Plan such as NPDES and Water Management Permits to be renewed, nonpoint source contracts to be issued, TMDLs to be developed (in accordance with the TMDL Strategy), as well as enforcement activities necessary to implement TMDLs.

What happens in Year 5?

During Year 5, implementation of corrective actions continues and an evaluation is made to determine how successfully the Watershed Approach has promoted improved water resource management so that adjustments can be made during the next 5-year cycle.

What is the role of the Executive Office of Environmental Affairs?

In order to ensure that a more broad evaluation of resources is employed through the Watershed Approach, the Executive Office of Environmental Affairs has hired watershed team leaders for each of the 27 watersheds in Massachusetts. The goal of those teams is to prioritize important environmental issues needing to be addressed, to build local capacity to address problems and support implementation actions, and to ensure proper outreach and coordination among the stakeholders in each watershed including participation of all state and federal agencies.

What is the Water Management Program?

DEP reviews requests to withdraw surface and groundwater in excess of 100,000 gallons per day from river basins in order to ensure that:

- new withdrawals will not cause a negative impact on those users already withdrawing water
- withdrawals will not exceed the safe yield of a water source, and
- environmental resources are not negatively impacted.

What activities occurred in 2001 for the Water Management Program?

DEP continued its efforts to enter into Consent Orders with facilities that were found to be violating Water Management Act registrations by excessive withdrawals during the 1997 through 1998 registration renewal efforts.

Since the last update on status of these cases DEP has taken the following actions:

- Nearly finalized a Consent Order for the restoration of 8 acres of wetlands with Maranatha bogs, and is negotiating the penalty phase of the case.
- Issued an NON for WMA violations
- Processed three WMA permits for a total of nine arising out of these cases.
- Assisted EPA with its investigation of Charles and Van Johnson for wetlands violations.

Five-year compliance review occurs during Year 3 of the Basin Cycle. This compliance review of 97 Water Management Program permits commenced in 1999 in the following basins: Hudson, Deerfield, Housatonic, Millers, Charles, Concord, North Coastal, South Coastal, Shawsheen, Taunton and Ten Mile.

DEP has continued to work on Registration Renewal cases. Remaining cases are all administratively problematic (poor documentation) or involve enforcement actions. Only 38 out of 933 registrations remain to be renewed.

What activities are planned for 2002 and 2003 in the Water Management Program?

Selection of basins for five-year compliance review has been reevaluated to address basins most in need of review and to better manage workload. Reviews will continue in the basins detailed above and the Merrimack basin will be added. Reviews in the Buzzards Bay, Cape Cod & Islands, Blackstone and Nashua basins will be postponed. In 2002, DEP will complete review of 137 permits. Reviews have been delayed due to lack of staff resources and continued difficulty in incorporating WMA responsibilities into regional duties. However, recent progress has been made in this area, specifically the hiring or otherwise designating staff dedicated to WMA duties, and the incorporation of the five-year reviews and review of wetlands monitoring plans associated with WMA permits into the FY 2002 Program Plan as Commissioner's Priorities. Forty permits are scheduled to be reviewed in 2003. During this review, enforcement actions will include issuance of field notices of noncompliance to parties that did not respond to DEP's orders to complete issued during the five-year review, and issuance of notices of noncompliance or higher level enforcement where DEP has determined substantial noncompliance exists with registrations and permits.

Five-year review has been underway in the Ipswich River Basin. This river is heavily impacted by groundwater withdrawals resulting in sustained low flow events and some no-flow events. A hydrologic model of the basin was created through funding by the DEP, the Department of Environmental Management and the United States Geologic Survey. This model was utilized throughout 2001, and will be further utilized to develop mitigation strategies for these withdrawal impacts. DEP is currently involved in actions with the towns of Wilmington and Reading to acquire public water supply from outside of the basin, enabling reduced reliance on sources that adversely affect the Ipswich River. These projects will require the preparation of Environmental Impact Reports (EIR). Meeting have been held to assist with the scoping of the reports and comments and project development will occur in 2002 and 2003. Flow thresholds are proposed which would result in restoration of aquatic habitat. Various recommendations for flow thresholds are being evaluated and plans to incorporate flow thresholds will advance in 2002.

What activities are planned for 2002 and 2003 in the Water Management Program? (concluded)

The Golf Course Policy, adopted in 2000, set reasonable industry standards for determining water use based on irrigated acreage, and ensures that courses which will exceed threshold volume will be required to file for a WMA permit prior to construction. The policy, in conjunction with proposed regulation changes, will also specify a filing schedule by which existing facilities exceeding the threshold volume can come into compliance. Potential cases for more immediate enforcement action have been identified and will be targeted for compliance and enforcement actions in 2002 and 2003.

The Water Management Program has drafted regulation changes that are presently undergoing internal review. Four meetings of the Water Management Act Advisory Committee were held. This committee was created by statute to facilitate policy and regulation development. At least one additional meeting of the Advisory Committee will be required. Upon finalization of draft regulations, DEP will commence the public hearing process. These regulation changes will improve the clarity of the regulations, and address problems identified by DEP during administration of the Act.

Why is the NPDES program important?

The National Pollution Discharge Elimination System (NPDES) program protects public health and the environment by the control of discharges to surface waters in Massachusetts.

What activities occurred in 2001 for the NPDES Program?

NPDES program staff continued its active participation in 2001. The focus of the program was to continue to address the "backlog" of expired NPDES permits in Massachusetts and to write permits which had expired or were due to expire in 2001 in the following watersheds: Connecticut, Chicopee, Nashua and Assabet. The program had the following main elements in 2001 many of which will also be continued in 2002:

- DEP staff continued to undertake the primary permit development responsibility for 35 NPDES permits (6 majors and 29 minors).

DEP continued to play a very active role in the Storm Water Phase 2 (SWP-2) program in 2001. This included:

- Regular meetings with EPA to develop a joint approach to develop the program (it will be a joint EPA and DEP permit program) and write the required general permits
- Review of EPA general permits
- Holding regional workshops with municipalities across the state to outline the major components of the program and to get feedback from the municipalities on their progress, problems and resource needs, and
- Establishment of a work group to develop a "generic" local by-law for storm water management which the EPA program requires the municipalities develop as a condition of their permit and storm water control program.

What activities will occur in 2002 for the NPDES Program?

DEP will continue and expand its active participation in the NPDES program. This includes: permit development, public and agency outreach on the program, primary evaluate permit needs for all permittees and applicants in 4 watersheds with a commitment to conduct such evaluations and issue permits as required for 31 permittees; an expanded participation in the development of the Storm Water Phase 2 permit program, and active oversight of the MWRA NPDES permit. Our staff will also work cooperatively with EPA permit writers on other permits by reviewing draft permits and expediting state input into the process. The EPA will also have primary responsibility for several permits with emphasis upon power plants (14 permits in various stages of development). DEP will continue to be active in power plant meetings and review of draft permits and provides technical input into the power plant permit process.

What activities will occur in 2002 for the NPDES Program?

The permits for which DEP will have primary responsibility will be for the following watersheds: Millers, Shawsheen, Islands and Parker. In addition, one permit in the French River watershed and one major permit in the South Coastal watershed will be developed. The permits are comprised of municipal and institutional wastewater treatment plants (both major and minor), industrial process treated wastewaters and selected other discharges which have the most significant environmental impact. Review of the status of the remaining permits (i.e., expired but not scheduled for re-issuance) will be part of the 2002 program. Issuance of these permits will bring the watershed current with its NPDES permit requirements. The proposed program will continue and expand a very active participation by DEP in the NPDES permit program. It will bring several watersheds current with the vast majority of their permits, will address some very old, expired permits and will continue the "team" approach to many other NPDES permits which helped facilitate significant progress in FY 2001.

DEP will continue to participate in the development and issuance of permits for several power plants in the state. DEP will expend considerable resources to develop policies and guidance documents which are needed to implement the NPDES permit program and to have the permit program and the water quality standards program complement each other.

DEP will continue to expand its work in Storm Water Phase 2 Program. The program will have the following components:

- Outreach: provide training sessions for DEP staff, transportation "MS-4s", other "non-municipal "MS-4s" (e.g. state colleges and prisons), and municipal officials on the implementation of the Storm Water Phase 2 Program.

General Permit Development:

- review the EPA general permits for the transportation "MS-4s", non-municipal "MS-4s" and construction activities 1-5 acres and,
- provide guidance to permittees on contents of the permits.

Coordinate Storm Water Phase 2 Subcommittee:

- complete local bylaw development.

Coordinate Program Communication:

- interaction and communication with DEP regional offices, and
- provide guidance to other agencies, consultants and the general public.

What activities will occur in 2002 for the NPDES Program? (continued)

Attend training sessions, seminars and conferences on the Storm Water Phase 2 Program:

- participate in local, regional and national conferences, and
- inform other staff of training opportunities.

Continue to track three communities during the program:

- develop an approach to track progress of municipalities during their involvement in the program, and
- work with community on problems during permit duration.

DEP permitting staff will continue to work with the DEP Boston Harbor coordinator on the Outfall Monitoring Science Advisory Panel. In addition, DEP actively follows the permit compliance for the "deliverables" of the MWRA NPDES permit for the Deer Island wastewater treatment plant. This includes numerous document reviews, site visits and coordination meetings with the MWRA.

What activities will occur in 2003 for the NPDES Program?

In 2003, DEP will continue its active role in the NPDES permit program. During 2002, DEP and EPA will evaluate the permits due for re-issuance in 2003 in the following watersheds: Westfield, Farmington, SuAsCo, Taunton and South Coastal. The agencies will divide primary responsibility for permit development according to available staff resources. In addition, any permits which expire during 2003 but are not part of the "2003 permit year" group will also be divided. DEP will continue its support of power plant permits, begin review of Storm Water Phase II storm water management plans submitted by MS-4's as part of a permittee's permit requirements and will continue to work on policies and regulations necessary to properly support the NPDES permit program.

Why are the Wastewater Management Programs important? How are they organized?

The Wastewater Management Programs include:

- the Groundwater Discharge Program for discharges to groundwater in excess of 10,000 gallons per day, and the Title 5 Program for on-site sewage disposal. These two programs are designed to protect groundwater and, in particular, drinking water aquifers.
- the Watershed Permitting Programs, encompassing the NPDES, Water Management, and Residuals Programs. This structure allows for better integration of activities relating to wastewater, water withdrawals, and residual disposal into the Basin Schedule.

What regulation changes are proposed for 2002?

Revisions to Title 5 Regulations will be submitted for approval by the Governor's Office, and will be sent out for public hearing and promulgation later this year. These regulation revisions have been postponed while the Governor's Affordable Housing Committee completes its report. Revisions to the Water Quality Standards will be targeted by the end of the calendar year.

What activities will occur in 2002 and 2003 for the Wastewater Management Programs?

DEP will continue to implement the comprehensive compliance strategy for the Groundwater Discharge Program developed in 2000. Like the NPDES strategy mentioned above, the groundwater strategy established minimum levels of enforcement action to be taken for violations found in inspection of facilities and for violations documented in Daily Monitoring Reports. The strategy provides clear guidance of when to take enforcement action, what action is required, establishment of protocol for review of Daily Monitoring Reports at appropriate intervals. The establishment of "enforcement threshold" criteria included in the compliance strategy.

DEP continued implementing its inspection program of large systems. These systems are subsurface sewage disposal systems with design flow in excess of 10,000 gallons per day. System inspections are required to occur according to the Basin Schedule, and the resulting reports must be submitted to DEP. Systems failing to protect public health or the environment must be upgraded. DEP is conducting enforcement actions against entities that fail to inspect their large systems, or fail to report the results.

What activities will occur in 2001 for the Wastewater Management Programs? (continued)

DEP will revisit its Reuse Policy that allows the utilization of wastewater for golf course and nursery irrigation, artificial recharge of aquifers and toilet flushing at commercial facilities. The policy establishes stringent treatment and precautions for the protection of public health and the environment. The technical advisory committee is reviewing these standards. It is anticipated that during 2002, the Reuse Policy will be revised to reflect the outcome of the technical advisory committee's review. In addition, DEP is currently evaluating and redesigning the entire industrial wastewater program.

The following wastewater management activities will continue, and will be integrated into the basin schedule:

- Identification of sewer leaks
- Identification of illegal sewer connections into stormwater systems
- Water quality assessments at all POTWs to verify self-monitoring reports and compliance with permit conditions (including residuals)
- Inspection and/or groundwater monitoring at suspected large on-site systems and groundwater discharge permit facilities
- Follow-up investigation of "hot spots" indicating wastewater sources, and
- Identification and support of innovative technologies that can be more effective or cheaper than current technology, and
- DEP is working on policies regarding phosphorous controls at wastewater treatment plants, guidance documents for the formation of wastewater districts, and guidance for Comprehensive Water Resources Management Plans.

3. Challenges for 2002-2003 and Beyond

What is DEP doing to improve the assessment of water resources in Massachusetts?

The previous sections demonstrate the need to expand the water quality monitoring and assessment programs to better address questions and concerns about the quality of the waters in the Commonwealth. Specifically, more resources are needed to collect data necessary for: the 305(b) Report; development and confirmation of impaired waters on the 303(d) List; the development of TMDLs; and assisting the watershed teams with problem and source identification. DEP conducted several activities during 2001 to better define the needs and address the issue of water quality monitoring and assessment. The following summarize those actions:

- DEP updated a workload model for state use (using the Cadmus model) to estimate the amount of resources needed to meet the expanding needs of not only the assessment and monitoring programs but all water programs as well. The challenge will be to obtain financial support for implementation.
- During 2001 DEP, through the Massachusetts Watershed Initiative, obtained funding to continue 2 staff positions in our assessment program and hire 5 new monitoring coordinators to develop and implement monitoring plans and coordinate volunteer monitoring groups. The staff are now on board and are beginning to develop monitoring plans for 2002. The challenge for 2002-2003 is to train the new staff in monitoring and assessment protocols so that they can be quickly integrated into the program activities.
- DEP obtained funding for and was able to hire seasonal help to assist in summer data collection and laboratory analytical work, also with the assistance of the Watershed Initiative. The challenge for 2002-2003 will be to obtain sufficient funding to hire seasonal help during the summer months.
- DEP, in cooperation with Mass GIS, continues the process of developing water quality assessment maps and data links, which will assist the watershed teams with problem identification and targeting limited resources to identify the source of each problem. The challenge for 2002 and 2003 will be to increase data management capability to support these activities on a continuous basis.
- DEP, through a contract with the United States Geological Survey, has developed and will soon publish by the end of the 2001 calendar year a statewide monitoring strategy that evaluates several levels of data needs and estimates the resources necessary to achieve those goals. The challenge will be to obtain the necessary resources for implementation.
- DEP has contracted with CH2M Hill (a consulting firm) to conduct a detailed evaluation of the state TMDL program, including its technical approach, listing/de-listing process, and resource capabilities. The evaluation will include recommendations for public outreach and a strategy to brief officials to obtain support for the necessary financing for expansion of the TMDL program. A Steering Committee has been established to provide recommendations to meet these goals. The challenge for 2002-2003 is to implement the recommendations made in the report.
- DEP continues to work with the Watershed Initiative Steering Committee and the Executive Office of Environmental Affairs to develop, expand, and assist the capability of volunteer monitoring organizations.

What is DEP doing to improve the assessment of water resources in Massachusetts? (continued)

- With the assistance of our four new regional nonpoint source coordinators DEP developed a nonpoint action strategy that targets impaired waterbodies in each watershed on a segment-by-segment basis. The strategies have been incorporated into our non-point source management plan and will serve as a "living" tool for use by both DEP and the EOEA Watershed teams on an ongoing basis.
- In addition, DEP is working cooperatively with the School of Marine Studies and Technology (SMAST) at UMASS-Dartmouth, on a project to define the nitrogen carrying capacity of the most sensitive embayments. The goal of this multi-year project is to develop plans to limit nitrogen inputs to levels that will not jeopardize water quality.

What are other issues facing watersheds?

A growing and significant issue is the increasing alteration of hydrology of watersheds due to increasing water withdrawals, interbasin transfers of water and wastewater, abandoned dams, and stormwater runoff associated with development. DEP has worked and will continue to work on a variety of efforts to address this issue.

B. Baseline Conditions

Baseline environmental conditions regarding point and nonpoint discharges to surface and groundwater at the start of the 2002 PPA period include:

- 59% of assessed river miles fully or partially support aquatic life
- More than 43% of assessed river miles are fully or partially swimmable
- About 73% of assessed lakes fully or partially support their uses
- 64% of assessed marine waters fully or partially support their uses, and
- Public health fish consumption advisories for specific waterbodies in 2001: 85 - mercury; 16 - PCBs; 3- pesticides; 2 - dioxin; 1 - PAH.

C. Milestones

Note

Watershed-specific milestones and environmental indicators will be included in individual Watershed Management Plans. Beginning in 2001, DEP will include in its Watershed Action Plans an estimate of the numbers of stream miles, lake acres, and square miles of marine waters that are expected to be restored to designated uses as a result of our implementing the TMDLs included in the Plans. In addition, the action plans also include targeted activities in each watershed to address water quality impairments. The reader is referred to the action plans for specific details.

The lists below and on the following page describe the milestones DEP will achieve to reduce, eliminate and control point and nonpoint discharges between 2001 and the end of 2005.

By the end of 2001

- 43% of Water Management Act permits were reviewed for compliance
- The annual electronic 305(b) Update will be submitted on April 1, 2000 — *Electronic submittal for 2000 made in September 2000, 2001 submittal not made because no new data was available. New information will be updated in 2002*, and
- By December 31, 2001 DEP will submit a proposal, for competitive grant projects related to the partial 104(b)(3) award for 2002 for water quality and wetlands. For non-competitive 104(b)(3) funds DEP will issue an RFR in January and finalize work plans in April 2002.

By the end of 2002

- A completed 305(b) Report will be submitted by April 1, 2002 or an integrated list that stratifies the requirements of both 305(b) and 303(d) will be submitted by October 2002 in accordance with EPA guidance
- An updated 303(d) List will be submitted in accordance with EPA timelines (see previous bullet)
- DEP will continue to work with EPA to revise the State Water Quality Standards and finalize proposed regulations for public comment by March 2002 with a goal of completing revisions during FY02. A preliminary draft has been sent to EPA for comment; however many additional changes will be required, EPA needs to respond to draft submittals
- DEP will implement the TMDL/303(d) program in accordance with the 1998 TMDL strategy as revised and updated in EPA's letter of September 10, 2001. This will include the submission of the following TMDLs, subsequent to receiving public comment, for final EPA approval by June 1,2002: TMDLs for 29 lakes in the Connecticut, Chicopee, and Blackstone River Basins; Neponset River fecal Coliform TMDL; Little Harbor TMDL; 7 Shawsheen River TMDLs; 6 previously identified individual lake TMDLs; and 20 of the 48 lake TMDLs identified in DEP's August 29, 2001 status report, and
- 100% of wastewater treatment plants will have operators in compliance with certification programs.

By the end of 2003	• An electronic update of the 305(b) Report will be submitted • DEP will coordinate the 2003 New England Association of Aquatic Biologists conference (this conference is on a rotating schedule involving all New England States), and • Develop TMDLs as negotiated with EPA at the end of 2002.
By the end of 2004	• A completed 305(b) Report will be submitted by April 1, 2004 or as otherwise in accordance with EPA timelines and guidance, and • An updated 303(d) List will be submitted in accordance with EPA timelines and guidance.
By the end of 2005	• 100% of Water Management Act permits will be reviewed for compliance • 100% of publicly owned treatment works will be in compliance with self-monitoring reports and permit conditions as defined by DEP and EPA's compliance and enforcement protocols, or will be subject to a compliance schedule as appropriate to bring them into compliance • An electronic update of the 305(b) Report will be submitted in accordance with EPA timelines and guidance, and • 100% of NPDES permittees will be in compliance with permit conditions as defined by DEP and EPA's compliance and enforcement protocols, or will be subject to a compliance schedule as appropriate to bring them into compliance.

D. What needs to be done:

1. Implement watershed-based assessment, permitting, compliance, enforcement, public outreach, and nonpoint source control.

Management Strategies

This is how DEP will implement watershed-based assessment, permitting, compliance, enforcement, public outreach, and nonpoint source control:

- Continue to implement Massachusetts Watershed Initiative
- Submit Watershed Action Plans which include the activities required of DEP to implement the recommendations of the EOEA Watershed Management Plan and issues identified in the water quality assessment reports and non-point source action strategies
- Implement a TMDL/303(d) program in accordance with the TMDL Strategy (see previous commitment under 2002 milestones)
- Develop water quality assessment reports for the watersheds identified in Table 5: "Watershed Management Activities and Basin Schedule"
- Conduct water quality monitoring in the watersheds identified in Table 5: "Watershed Management Activities and Basin Schedule"
- DEP will identify POTWs where it would be appropriate to reduce discharge monitoring requirements in exchange for instream monitoring requirements and will work with the POTWs to implement these changes at the time of NPDES renewal
- DEP will develop a compliance strategy and obtain EPA approval to shift resources that will result in fewer NPDES major inspections and more NPDES minor inspections
- DEP will continue efforts to develop and obtain adequate funding of a comprehensive water quality monitoring and assessment program, and
- DEP will develop a strategy to obtain ambient monitoring assistance from NPDES permittees.

P-A-C-E-R Activities

We will carry out our management strategies through these activities.

Permitting:

- See Table 5: "Watershed Management Activities and Basin Schedule," and
- Conduct permit review of power plant proposals.

Assistance:

- DEP will participate in watershed team meetings and activities in all 27 watersheds as requested and appropriate to DEP programmatic functions.

Compliance:

- At the completion of watershed assessment activities in Year 3, develop the 303(d) List of segments not in compliance with water quality standards for inclusion into the 303(d) Update completed every two years
- Review discharge monitoring reports and toxicity reports, and
- Conduct data base review of groundwater discharge permit facilities for determination of compliance with monitoring, reporting, and permit renewal requirements.

P-A-C-E-R Activities (continued)

Compliance, continued:

- Conduct inspections of:
  - ⇒ suspect groundwater discharge permit facilities
  - ⇒ major and minor NPDES permitted facilities
  - ⇒ Title 5 systems
- Perform inspections and other reviews of delegated authority of POTW pretreatment requirements
- Conduct follow-up investigations on a case-by-case basis for remediation of "hot spots" identified through basin assessments
- As a result of basin team efforts, DEP shall submit to EPA the information required according to the schedule in Table 5, and
- Conduct other inspections to:
  - ⇒ follow-up on compliance issues identified in previous inspections
  - ⇒ investigate complaints
  - ⇒ investigate patterns of noncompliance, and
  - ⇒ implement other initiatives.

Enforcement:

- Enforce on a case-by-case basis remediation of "hot spots" identified through water quality assessments
- Initiate enforcement activities necessary to implement TMDLs contained in the Watershed Action Plans where appropriate
- Continue to implement the NPDES Comprehensive Compliance and Enforcement Strategy for DEP's Bureau of Resource Protection
- Continue to implement the Groundwater Discharge Program Comprehensive Compliance Strategy for DEP's Bureau of Resource Protection, and
- Take enforcement in accordance with the schedule in Table 5.

P-A-C-E-R Activities (continued)

Regulation development (includes policy/program development and legislation)

- Finalize and promulgate revisions to Title 5, Residuals and Water Management Act Regulations.
- Finalize and promulgate revisions to the Water Quality Standards
- Complete internal development and review of Water Management Act Regulation revisions; if appropriate, move forward with public hearing and promulgation (Determination of water use by cranberry bogs and golf courses)
- Complete internal review of revised Biosolids and Beneficial Use Regulations; if appropriate, move forward with public hearing and promulgation, and
- Redesign program that regulates industrial wastewater, including the sewer connection regulation program (rescind sanitary connection permits; revise industrial requirements).

Environmental Monitoring:

- Water Quality Monitoring will be conducted in the following watersheds during 2002 and 2003:
  - ⇒ 2002: Charles, Ten Mile, North Coastal, Hudson, and Housatonic
  - ⇒ 2003: Connecticut, Chicopee, Nashua, Blackstone

Water Quality Assessments:

- Water Quality Assessments will be developed in the following watersheds
  - ⇒ Cape Cod, French & Quinebaug, Merrimack, Parker, Narragansett/Mount Hope Bay, and Boston Harbor Watersheds by March 1, 2002
  - ⇒ Deerfield, Millers, Shawsheen, Ipswich, Buzzards Bay, Islands, by November 1, 2002
  - ⇒ Westfield, Farmington, Taunton, Concord, South Coastal, by August 1, 2003, and
  - ⇒ Hudson, Housatonic, Charles, Ten Mile, North Coastal, by January 1, 2004.

Other:

- Evaluate how the revised STORET system could be used by DEP to manage and share water quality data.

2. Control inland and coastal nonpoint sources of pollution.

Management Strategies

This is how DEP will control inland and coastal nonpoint sources of pollution:

- Implement statewide nonpoint source plan, including targeting of funds to address the highest priority nonpoint source problems.

P-A-C-E-R Activities

We will carry out our management strategy through the following activities.

Assistance:

- Outreach to communities and public about nonpoint sources of pollution, although DEP will be limited to a more passive role because this activity will be conducted primarily by the EOEA basin teams. DEP also hired 4 new regional nonpoint source coordinators in 2000 to assist teams and potential applicants with defining and scoping Section 319 projects that address 303(d) listed waters and TMDL implementation plans
- Continue targeted technical assistance education regarding stormwater policy aimed at local officials, and
- DEP will develop, finalize, and implement non-point source action strategies in each of the 27 watersheds in Massachusetts. These spreadsheet documents will be used as living documents for DEP and the EOEA teams to target 303(d) listed waters and waters where TMDLs have been developed for remedial action.

Compliance:

- Conduct other inspections to: follow-up on compliance issues identified in previous inspections; investigate complaints; investigate patterns of noncompliance; implement other initiatives, and
- Conduct nonpoint source training workshops with conservation commissions within targetted watersheds, which shall include information on the state Stormwater Policy.

Regulation development (includes policy/program development and legislation):

- Continue, as appropriate, to support recommendations outlined in the Comprehensive Conservation Management Plans for Buzzards Bay and Massachusetts Bays Estuary Program, participate in the review and approval for plan revisions and updates*, and
- Assist CZM in the completion of the various tasks that apply to DEP programs as identified in the CZM 5-year and 15-year coastal nonpoint source strategy.

* Examples include wetlands mapping; reducing and preventing nonpoint sources of pollution through the distribution of a nonpoint source manual, technical assistance, development of stormwater regulations and hiring of a stormwater coordinator for the Blackstone River; reducing and preventing oil pollution through a new policy and the encouragement of innovative technologies; multiple approaches to protect nitrogen sensitive embayments, including Buzzards Bay.

3. Improve wastewater treatment and management.

Management Strategies

This is how DEP will improve wastewater treatment and management:

- Develop, implement, and fund local and regional wastewater management plans
- Ensure optimal management of publicly owned treatment works through enhanced outreach and technical training
- Utilize the State Revolving Fund, the state funded Community Septic Management Program, the state subsidized Massachusetts Housing Finance Agency private bank loan program, and the Title 5 state income tax credit program to provide homeowners with comprehensive financial assistance for the upgrading of Title 5 systems, and
- Develop and publicize new comprehensive Wastewater Management Planning Guidelines.

P-A-C-E-R Activities

We will carry out our management strategies through these activities.

Assistance:

- Distribute and manage $40 million in funds to upgrade failing residential septic systems through the Community Septic Management and MHFA programs
- Implement the State Revolving Loan Fund Program to:
  - ⇒ Oversee more than $1.1 billion of construction costs for wastewater treatment projects
  - ⇒ Manage the construction, payment, and closeout of almost all remaining active federal and state wastewater and water supply grants awarded to communities and districts since 1980, and
- Develop list of Section 104(b)(3) wetlands and water quality projects. The timing, process, and list of recommended projects will be sent to the EPA for comment. Similarly, recommended projects under Section 319, including supplemental funds, and Section 604(b) shall be sent to EPA prior to notice of approval.

P-A-C-E-R Activities (continued)

Compliance:

- Continue joint comprehensive evaluation with EPA of the Nashua River watershed and ensure that appropriate data is gathered and analyzed for development of TMDLs and Waste Load Allocations
- Conduct compliance reviews pursuant to the Water Management Act and integrate water withdrawal with wastewater management via the Watershed Approach, and
- Conduct other inspections to:
  - ⇒ follow-up on compliance issues identified in previous inspections
  - ⇒ investigate complaints
  - ⇒ investigate patterns of noncompliance, and
  - ⇒ implement other initiatives.

Regulation development **(includes policy/program development and legislation):**

- Finalize and promulgate revisions to Title 5 and Water Management Act regulations
- Finalize and promulgate revisions to the Water Quality Standards
- Complete internal review of revised Biosolids and Beneficial Use Regulations, if appropriate, move forward with public hearing and promulgation, and
- Revise Certification of Operators of Wastewater Treatment Facilities. (Add exam for on-site treatment approved under Title 5).

Table 4: Environmental Indicators and other Performance Measures associated with the Goal to "Reduce, eliminate, and/or control both point and nonpoint discharges to surface and groundwater."[6]
Environmental Indicators
• # of assessed acres open, conditionally open, restricted, and closed to shellfishing • *# and % of assessed river miles, lake acres, and estuary square miles that have water quality supporting beneficial uses, including, where applicable, for: a) fish and shellfish consumption; b) recreation; c) aquatic life support; d) drinking water supply (The reporting period is two years)*
Program Outcomes
• # of assessed river segments, lakes, and ponds with water quality impairments • % of NPDES discharge permittees in compliance with permit effluent limits • *# and % of impaired, assessed river miles, lake acres, and estuary square miles that a) are covered by developed TMDLs and reported in the Watershed Action Plans* • *% of POTWs that are beneficially reusing all or a part of their biosolids and, where data exists, the % of biosolids generated that are beneficially reused*
Program Outputs
• DEP water quality assessment reports • DEP Watershed Action Plans • 305(b) electronic update • 303(d) update • TMDLs • *% of river miles and lake acres that have been assessed for the need for fish consumption advisories; and compilation of state-issued fish consumption advisory methodologies, as reported through the National Listing of Fish and Wildlife Advisories* • *The TMDL status for each state, including: a) the number of TMDLs identified on the 1998 303(d) list that the state and EPA have committed to produce in the two year cycle; b) the number of TMDLs submitted by the state to EPA; c) the number of state-established TMDLs approved by EPA; and d) the number of EPA-established TMDLs (This cumulative measure would be jointly reported by EPA and the state)*
• *# and % of facilities that have a discharge requiring an individual permit: a) that are covered by a current individual permit; b) that have expired individual permits; c) that have applied for but not been issued an individual permit, and d) that have individual permits under administrative or judicial appeal** • *# of storm water sources associated with industrial activity, # of construction sites over five acres, and # of designated storm water sources (including Municipal Phase I) that are covered by a current individual or general NPDES permit** • *# of permittees (approximately 900 CSO communities nationwide) that are covered by NPDES permits or other enforceable mechanisms consistent with the 1994 CSO policy** • *# and % of approved pretreatment programs audited in the reporting year. Of those, the # of audits finding significant shortcomings and the # of local programs upgraded to achieve compliance**

Note: Watershed-specific environmental indicators will be included in the Watershed Management Plans.

*DEP will rely on EPA reporting on these Core Performance Measures because Massachusetts does not have delegation.

[6] Items that are italicized are also Core Performance Measures.

Table 5: Watershed Management Activities and Basin Schedule

Watershed Management Activities	The basin schedule is keyed to calendar year January to December.				
	2002	2003	2004	2005	2006
Year 1 Activities • Participate in EOEA Team meetings and outreach activities. • Review of Historical Data: ➢ identify permit holders * NPDES * Water Management Act ➢ identify available land use mapping * reports/databases * GIS * potential Water Quality Management Planning Grants [CWA section 604(b)] Note: DEP no longer writes basin plans. These are now the responsibility of the EOEA watershed teams. • Develop survey/monitoring plan, addressing basin concerns raised, literature reviews, and attend meetings with public, as appropriate.	Connecticut Chicopee Nashua Blackstone	French & Quinebaug Merrimack Boston Harbor: (Neponset) Parker Cape Cod Narragansett	Deerfield Millers Shawsheen Ipswich Buzzards Bay Islands	Taunton Farmington Westfield South Coastal SUASCO: (Sudbury, Assabet, Concord)	Ten Mile Charles North Coastal Housatonic Hudson
Year 2 Activities • Conduct environmental monitoring • Complete Section 604(b) grants and use information • Assist EOEA in activating citizens' monitoring programs • Coordinate information with other state and federal agencies • Inspect groundwater discharge permit facilities • Conduct sanitary surveys • Conduct compliance inspections of NPDES major permittees	Ten Mile Charles North Coastal Housatonic Hudson	Connecticut Chicopee Nashua Blackstone	French & Quinebaug Merrimack Boston Harbor: (Neponset) Parker Cape Cod Narragansett	Deerfield Millers Shawsheen Ipswich Buzzards Bay Islands	Taunton Farmington Westfield South Coastal SUASCO: (Sudbury, Assabet, Concord)

Watershed Management Activities	The basin schedule is keyed to calendar year January to December.				
	2002	2003	2004	2005	2006
Year 3 Activities • Evaluate survey information and monitoring data. • Develop water quality assessment report. • This does not occur on the cycle. It is required every year in electronic form and every two years on the even years in hard copy. • Initiate review of Water Management Act permits and registrations: ➢ 5-year compliance review ➢ identify violations and needed compliance and enforcement activities • Initiate review of NPDES permits, and assist EPA by conducting site visits and updating master permit limits • Develop NPS pollution grants; request RFR and select project	Taunton Farmington Westfield South Coastal SUASCO: (Sudbury, Assabet, Concord)	Ten Mile Charles North Coastal Housatonic Hudson	Connecticut Chicopee Nashua Blackstone	French & Quinebaug Merrimack Boston Harbor: (Neponset) Parker Cape Cod Narragansett	Deerfield Millers Shawsheen Ipswich Buzzards Bay Islands
Year 4 Activities • Participate in the development of watershed management plans with the EOEA Team including developing and submitting DEP action plans consistent with the Watershed Management Plans. • Develop Year 3 NPS proposals into contracts: ➢ manage projects • Water Management Act: ➢ issue modified permits ➢ take enforcement actions • NPDES: ➢ review permits ➢ re-issue permits with EPA (subject to state delegation) ➢ take enforcement actions ➢ draft selected NPDES permits • Develop Total Maximum Daily Load (TMDL) (Submit as appropriate to EPA for review and approval.) • Develop financing options for implementing recommended solutions	Deerfield Millers Shawsheen Ipswich Buzzards Bay Islands	Taunton Farmington Westfield South Coastal SUASCO: (Sudbury, Assabet, Concord)	Ten Mile Charles North Coastal Housatonic Hudson	Connecticut Chicopee Nashua Blackstone	French & Quinebaug Merrimack Boston Harbor: (Neponset) Parker Cape Cod Narragansett

Watershed Management Activities	The basin schedule is keyed to calendar year January to December.				
	2002	2003	2004	2005	2006
Year 5 Activities • Develop Section 604(b) planning grant request RFR: ➢ select winning proposals	French & Quinebaug Merrimack Boston Harbor: (Neponset) Parker Cape Cod Narragansett	Deerfield Millers Shawsheen Ipswich Buzzards Bay Islands	Taunton Farmington Westfield South Coastal SUASCO: (Sudbury, Assabet, Concord)	Ten Mile Charles North Coastal Housatonic Hudson	Connecticut Chicopee Nashua Blackstone

Achieve Clean Water and Protect Aquatic Ecosystems

Clean Water Goal #3: No Net Loss of Wetlands

Achieve Clean Water and Protect Aquatic Ecosystems
Clean Water Goal #3: No Net Loss of Wetlands
A. Self Assessment

1. Status of Wetlands Resources in Massachusetts

Why are wetlands important?

Wetlands, or wetland "resource areas" as we call them in Massachusetts, range from broad floodplains along the Connecticut and other rivers, to beach and dune systems along the coast, to bogs in southeastern Massachusetts, to freshwater and saltwater marshes throughout the state, and to the most common type of wetland in Massachusetts, the wooded swamp.

These resource areas are important to Massachusetts' citizens because they:
- provide flood control
- prevent storm damage
- protect public and private ground and surface water supplies
- prevent pollution, and
- protect fisheries, shellfisheries, and wildlife habitat.

In addition, these resource areas provide recreational and aesthetic functions that enhance our quality of life and add diversity and character to our landscape.

What are vegetated wetlands? Why are they important?

Vegetated wetlands are areas where groundwater discharges to the surface and where, under certain circumstances, surface water discharges to groundwater. This situation creates conditions that promote the growth of certain types of vegetation defined under the Wetlands Protection Act and Wetlands Regulations. The combination of hydrology and vegetation is thereby used to determine which areas are wetlands and which are not.

Vegetated wetlands may or may not border waterbodies. The following are examples of vegetated wetlands:
- freshwater swamps
- marshes
- bogs
- wet meadows, and
- salt marshes in coastal ecosystems.

Vegetated wetlands perform many important functions, including the removal of excess nutrients and contaminants from runoff and the ability to slow and retain flood waters. Conversely, in times of drought, vegetated wetlands help maintain minimum water flow levels in rivers and streams.

Vegetated wetlands provide important:
- food supplies
- shade
- cover
- breeding areas, and
- migratory and overwintering areas for many birds, mammals, amphibians, reptiles, and invertebrates

Salt marsh plants also serve as barriers between fresh groundwater and the ocean, thus protecting the quality of groundwater, and helping to dissipate storm energy and flood damage.

What other inland and coastal resource areas are protected?

In addition to vegetated wetlands, Massachusetts protects a wide range of resource areas at the land/water interface.

Inland resource areas include:

- banks
- land under waterbodies
- land subject to flooding, whether bordering waterbodies or isolated, (including the 100-year floodplain and vernal pools), and
- a riverfront area along perennial rivers and streams.

Coastal resource areas include:

- land subject to coastal storm flowage
- land beneath the ocean and salt ponds
- coastal banks
- coastal dunes
- coastal beaches (including tidal flats)
- barrier beaches
- rocky intertidal shores
- the banks and land under anadromous/catadromous[7] fish runs, and
- land containing shellfish.

What estimates exist concerning the quantity and types of wetlands?

Previous researchers have attempted to estimate the quantity and type of wetland communities in Massachusetts. One study estimated that Massachusetts had approximately 590,000 acres of wetlands in the mid-1970s, representing about 12% of the state's land area. Approximately 80% of the state's wetlands were estimated to be freshwater swampy wetland, with forested wetlands dominating at approximately 56% of the wetland resources statewide. The remaining 20% of the state's wetlands were estimated to consist of tidal wetlands, consisting primarily of salt and brackish marshes (40% of tidal wetlands) and tidal flats (37% of tidal wetlands).

[7] Anadromous fish are ocean dwellers that migrate to fresh water to spawn. Catadromous fish are fresh water dwellers that migrate to salt water to spawn.

How is wetlands data collected today? What will we learn about wetlands with the new data?

Through the DEP Wetlands Conservancy Program, Massachusetts has begun to develop the comprehensive data necessary to replace these estimates with much more exact information on current wetlands loss or gain. The Wetlands Conservancy Program has made substantial progress mapping the state's wetlands at a scale (1:5,000) that will be useful for future comparisons. To date, the Wetlands Conservancy Program has acquired color infrared aerial photographs and orthophotoquads for 100% of the state. Wetland resources are being delineated, classified, and automated as a Geographic Information System (GIS) database. Approximately 65% of the state is included in this new GIS wetland datalayer. Over 65% of the area included in the new database is mapped as upland, with approximately 35% of this area classified as wetland or open water. Approximately 205,029 acres, or 10.1% of the state in the new GIS datalayer, consists of inland and coastal wetlands (not including open water areas and their associated resource areas, such as land under water bodies and tidal flats). As more of the state is included in the GIS layer, these figures will be refined and acreage for each specific type of resource area will be calculated.

The DEP Wetlands Conservancy Program is also the first in the nation to complete a border-to-border inventory and mapping project of Massachusetts' eelgrass resources. To date, the project has identified an estimated 36,400 acres of eelgrass. This information has also been digitized as a new GIS datalayer, and will be useful as a baseline for tracking the health of this resource in the future.

This new information will assist DEP in comparing future data and measuring progress toward protecting the state's wetlands. While we know that Massachusetts' wetlands have been filled and dredged since colonial times, and various studies have estimated previous losses, we do not know the current rate of wetland loss under modern and stringent regulatory requirements.

How much wetlands are we losing?

One study, based upon soil types, estimated that freshwater wetlands in Massachusetts originally covered approximately 818,000 acres, or 16.5% of the state. The U.S. Fish and Wildlife Service estimated in 1990 that approximately 28% of Massachusetts' wetlands (defined to include inland marshes, swamps, and bogs, as well as tidal wetlands, such as salt marshes and tidal flats) have been lost since colonial times (1780-1980). A 1988 study by the U.S. Fish and Wildlife Service reported on more recent trends in southeastern Massachusetts, and estimated losses in that part of the state at approximately 150 acres per year, a rate of approximately 0.2%. More detailed information on wetland losses will be available in the future as new information is compared to the Wetlands Conservancy Program datalayer.

2. Wetlands Program

What is the significance of the Wetlands Protection Act and the river-front provisions?

Massachusetts has always been a leader in wetlands protection, starting with passage of the nation's first wetlands protection statute in 1963. Since then, Massachusetts has continually improved its comprehensive regulatory programs to ensure continued progress.

How does the Wetlands Act work?

Most recently, DEP promulgated regulations to implement the Rivers Protection Act (Rivers Act) that was passed in 1996 as an amendment to the Wetlands Protection Act. By creating a 200-foot riverfront resource area (25-foot in some densely developed areas), the Rivers Act and regulations represent an important step towards improving water quality and protecting wetland resources from nonpoint source problems along Massachusetts rivers and streams. These regulatory changes were also supplemented by the adoption of a Massachusetts Stormwater Policy (March 1997) to control stormwater runoff and associated nonpoint pollution.

Under the Wetlands Protection Act and its regulations, permit applications called Notices of Intent must be filed with the appropriate municipal conservation commission for any activity proposed within a resource area (including the riverfront resource area), or within the 100-foot buffer zone that surrounds many of the resource areas. After public notice and a public hearing, the conservation commission issues a permit called an Order of Conditions. If the project meets regulatory performance standards, the conservation commission may issue an approval; if not, the project must be denied. While conservation commissions are the primary permitting and enforcement agents under the Wetlands Protection Act, DEP reviews appeals through its four regional offices and issues Superseding Orders of Conditions as necessary. DEP shares enforcement authority with conservation commissions, and sets overall regulatory and policy directions, provides technical support and training, coordinates with state and federal agencies, and hears variance requests.

How does the Water Quality Certification Program work?

The Water Quality Certification (WQC) program is linked to the federal Clean Water Act requirement for states to certify that issuance of a federal permit will not violate state water quality standards. DEP has developed regulations that complement the U.S. Army Corps of Engineers' Programmatic General Permit for Massachusetts, as well as complement and enhance our Wetlands Protection Act. Most small projects (less than 5,000 square feet of wetland alteration) do not need an individual permit from the Army Corps of Engineers or a separate water quality certification from DEP. Larger projects, or projects with specific types of impacts, do require separate review and permitting. For example, the WQC regulations cover work in isolated vegetated wetlands, while the state's Wetlands Protection Act does not. The WQC Regulations are able to look at cumulative impacts and to require an alternative analysis that is not generally performed under the Wetlands Protection Act. The WQC Regulations also impose strict performance standards on any project that has the potential to impact Outstanding Resource Waters (identified by DEP under regulation). These include drinking water supplies and tributaries; vernal pools; and some Areas of Critical Environmental Concern, which are identified by the Massachusetts Secretary of Environmental Affairs for protection and preservation as areas of unique environmental importance.

What is the Wetlands Conservancy Program?

The DEP Wetlands Conservancy Program conducts the aerial photography, photointerpetation, and map delineation of inland and coastal wetland resource areas. The mapping of the wetland resources in Massachusetts provides an invaluable tool which will assist DEP assessing future trends in the acreage and type of wetlands. The aerial photographs also serve as a valuable tool for wetland enforcement actions.

DEP also continues to administer two additional statutes enacted early in Massachusetts' wetlands protection history. The Inland and Coastal Wetlands Restriction Acts provide permanent deed restrictions on mapped wetland areas to protect them in advance of any work being proposed or performed. These efforts have resulted in the identification and protection of approximately 46,213 acres of coastal wetland resources in 42 communities, and approximately 8,000 acres of inland wetland resources in 16 communities. Combined, these restrictions amount to 54,213 acres in 58 communities.

3. Challenges for 2002-2003

How should DEP address continued loss of wetlands resources?

Even though Massachusetts has significantly strengthened its wetlands protection program over the past 25 years and has adopted a "no net loss" goal for its wetlands, incremental, small-scale wetland losses continue to occur. Because of strict regulatory performance standards, the rate of wetland loss each year from direct alteration is most likely low. However, it is also likely that wetlands are lost each year because of undetected violations and inconsistent administration of the regulatory programs. In addition, alterations may be permitted for variance projects with overriding public interests, such as public safety improvements, public health protection (i.e., hazardous waste cleanups or landfill closures), and environmental improvements such as resource restoration. Additional "limited projects" may also be permitted for purposes such as accessing upland properties or for agricultural conversions. In cases where wetland alterations are permitted, wetlands replication (mitigation) is required at a ratio of at least 1:1. Unfortunately, a recent study has shown that many replication areas fail to meet our regulatory criteria defining success, resulting in a greater loss of wetland resources than anticipated. DEP, in conjunction with EOEA's Wetlands Restoration and Banking program, is developing more detailed wetland replication guidance for use by conservation commissions, DEP staff, and the regulated community on wetlands replication in order to improve the quality of these replication projects.

Massachusetts wetlands are also subject to degradation from a wide variety of nonpoint source pollutants and land use changes. Nearby construction may change drainage characteristics, thus altering natural water levels. Nonpoint sources of pollution, such as road runoff containing salt, sediments, and a variety of other contaminants, often find their way into wetlands.

To help restore degraded wetlands, Massachusetts has embarked on an ambitious wetlands restoration program to enhance the quality and quantity of specific wetland resources. In addition, DEP is developing and implementing a number of measures designed to combat further degradation and improve the quality of receiving waters and associated wetlands, including a stormwater policy as well as "best management practices." DEP has also reorganized its permitting, compliance and enforcement staff along watershed lines, so that the focused expertise of regional staff can be applied more readily to solving water quality and wetlands problems in each river basin. Educational and enforcement strategies are also enhanced by the closer contact between DEP staff, municipalities, and community organizations in each river basin. Finally, a 200-foot buffer zone around perennial rivers and streams was established under the Rivers Protection Act. This will allow conservation commissions and DEP to condition projects to avoid continued degradation of the state's wetland resources.

B. Baseline Conditions

Of the 55% of the state that has been mapped, approximately 334,278 acres are inland. In addition, approximately 50,415 acres of coastal wetlands have been mapped.

C. Milestones

The lists below describe the milestones regarding wetlands DEP will achieve between 2001 and 2004:

By the end of 2001

- The second cycle of eelgrass mapping will be completed for three-quarters of the state; any loss or gain of eelgrass will be determined, and
- Wetlands replication regulatory standards will be issued.

By the end of 2002

- Wetland mapping, hardcopy production, and distribution of wetland maps for central Massachusetts will be completed by the end of 2002, and
- Using available information, include in annual PPA update a report that characterizes wetland losses from authorized and unauthorized fill of wetlands and gains resulting from wetland restoration activities.

By the end of 2003

- The second cycle of eelgrass mapping will be completed for the last quarter (Buzzard's Bay) of the state; any loss or gain of eelgrass will be determined.

By the end of 2004

- Wetland mapping, hardcopy production, and distribution of wetland maps for western Massachusetts will be completed by the end of 2004, and
- Two cycles of wetland mapping will have been completed, and a determination of wetland loss or gain will have been made.

D. What needs to be done:
1. Prevent loss of wetlands and replicate wetlands where appropriate.

Management Strategies

DEP will prevent loss of wetlands by ensuring consistent administration of the strict performance standards in the Wetlands Protection Act and regulations, and ensuring a net success rate equal to or greater than 1:1 for wetlands replication projects undertaken pursuant to wetland permitting or enforcement actions.

P-A-C-E-R Activities

We will carry out our management strategies through these activities.

Permitting:

- Continue to issue Superseding Orders of Conditions, as appropriate, and
- Continue to convert wetland program forms to an electronic medium; develop new wetland data base to improve data entry and data management in order to more effectively track wetland impacts and proposed mitigation.

Assistance:

- Finalize Wildlife Habitat and Wetland Replication Guidance for distribution to each conservation commission
- Develop a supplemental technical document on wetland replication and conduct a series of workshops for conservation commissions
- Subject to available funds, continue to provide one-on-one advice, support, and assistance on administration of the Wetlands Protection Act to conservation commissions through the Circuit Rider Program, and
- Coordinate with the state's proactive wetlands restoration project to ensure successful projects.

Compliance:

- Develop a compliance and enforcement strategy for prevention of wetland loss that complements basin-specific strategies.

Enforcement

- Improve enforcement tracking, adherence to the *Enforcement Response Guidance*, and issuance of enforcement documents, including penalty assessments, and
- Develop internal enforcement tools (such as standardized penalty amounts) for all wetlands program elements.

Regulation development **(includes policy/program development and legislation):**

- Amend wetland regulations to clarify riverfront area regulations such as "perennial/intermittent stream" definitions, drought criteria, "mouth of coastal river" definition, and lake management techniques. Policy development is planned to include guidance for conservation commissioners on wetland replication and wildlife habitat assessments.

2. Protect "riverfront areas" (These areas are 200 feet landward of mean annual high water of a river, or 25 feet in certain urbanized areas).

Management Strategies

DEP will protect riverfront areas by implementing the regulations promulgated in 1997 in response to the riverfront amendments of the Wetlands Protection Act.

P-A-C-E-R Activities

We will carry out our management strategies through these activities.

Permitting:

- Continue to issue Superseding Orders of Conditions, as appropriate, and
- Expand database to include riverfront resource areas, and begin data entry.

Assistance:

- Subject to available funding, maintain the effectiveness of Circuit Rider Program by providing one-on-one advice, assistance, and support to more conservation commissions
- Continue to work with the established Circuit Riders "networks" or similarly-situated conservation commissions, for training and mutual support, and
- Conduct training workshops on the Rivers Protection Regulations, including requirements for stormwater management and wildlife habitat evaluations contained in the riverfront provisions.

Compliance:

- Develop a compliance and enforcement strategy for the prevention of riverfront area loss that complements basin-specific strategies.

Enforcement:

- Improve enforcement tracking, adherence to the *Enforcement Response Guidance*, and issuance of enforcement documents, including penalty assessments, and
- Develop internal enforcement tools (such as standardized penalty amounts) for all riverfront program elements.

Regulation development **(includes program/policy development and legislation):**

- Establish policies as appropriate to implement the Rivers Protection Act regulations
- Promulgate regulations to clarify the distinction between perennial and intermittent streams as well as to revise the definition of the term **"**drought," and
- Develop policy on the term "mouth of the coastal river."

3. Implement stormwater "best management practices" (BMPs) to minimize degradation from runoff.

Management Strategies

This is how DEP will implement stormwater best management practices:

- Implement stormwater management standards, based on best management practices for stormwater runoff, and
- Increase emphasis on enforcement actions against violators of stormwater standards.

P-A-C-E-R Activities

We will carry out our management strategies through these activities.

Permitting:

- Continue to issue Superseding Orders of Conditions, as appropriate; include additional project review of stormwater impacts and the application of BMPs to control stormwater as part of the DEP Stormwater Policy.

Assistance:

- Work with EPA on Stormwater Phase 2 outreach and implementation of certain types of general permits
- Update *DEP Hydrology Manual* to include Stormwater Policy performance standards
- Distribute *DEP Hydrology Manual* and provide training to conservation commissions on Stormwater Policy performance standards, and
- Work with the Massachusetts Highway Department to improve communication and improve compliance with the Massachusetts Stormwater Policy.

Compliance:

- Develop and implement Stormwater Compliance Strategy with selective enforcement mechanisms.

Enforcement:

- Incorporate violation of Stormwater Policy as part of BRP-wide enforcement strategy.

Regulation development **(includes program/policy development and legislation):**

- Through continued meetings of a technical committee of DEP staff and consultants, analyze the effectiveness of current stormwater management standards in anticipation of regulatory revisions.

4. Identify and address unpermitted fillings and/or alterations of wetlands.

Management Strategies

This is how DEP will identify and address unpermitted fillings and/or alterations of wetlands:

- Identify areas of illegally filled wetlands through citizen complaints, conservation commission referrals, and staff investigations
- Identify unsuccessful restoration or replication projects through compliance inspections
- Use aerial photography to identify and prioritize enforcement for unpermitted wetland alterations, especially in targeted basins, and
- Take enforcement actions in accordance with the *Enforcement Response Guidance* against those that fill wetlands, and obtain full restoration or replication of any unrestored loss on at least a 1:1 basis.

P-A-C-E-R Activities

We will carry out our management strategies through these activities.

Permitting:

- Continue to issue Superseding Orders of Conditions, as appropriate.

Assistance:

- Sponsor or participate in educational workshops for conservation commissions on enforcement, particularly in targeted river basins, and
- Revise the *Enforcement Manual for Wetlands Protection in Massachusetts*.

Compliance:

- Develop a compliance and enforcement strategy for prevention of wetland loss that complements basin-specific strategies
- Adhere to Enforcement Response Guidelines in following up citizen complaints during the outreach stage (Year 1 of the 5-year basin plan)
- Screen, set priorities for, and follow up on citizen complaints brought forward in the outreach stage (Year 1) in targeted river basins, and
- Conduct inspections.

Enforcement:

- Improve enforcement tracking, adherence to the *Enforcement Response Guidance*, and issuance of enforcement documents, including penalty assessments
- Develop internal enforcement tools (such as standardized penalty amounts) for all wetlands program elements
- Increase publicity surrounding wetlands enforcement actions to serve as a deterrent to future violations, and
- Target major violators through implementation of the Watershed Approach and take enforcement actions.

Table 6: Environmental Indicators and other Performance Measures associated with the Goal of "No net loss of wetlands."
Environmental Indicators
• Acres of wetlands in Massachusetts maintained over time • Areal extent, density, and distance to the outer edge of plant growth for several eelgrass *(Zostera marina)* aquatic beds in selected estuaries • Acres of degraded wetlands restored over time
Program Outcomes
• Acres of wetlands lost (through permitting process and estimate of acres lost from illegal fill) compared to: ⇒ Acres of wetlands restored or replicated through the permitting process ⇒ Acres of wetlands restored or replicated due to enforcement
Program Outputs
• Report on progress of statewide mapping of wetlands and coastal eelgrass • Report on status of wetlands lost compared to wetlands restored and/or replicated